IACS

International Association
of Classification Societies

Annual Review 2022

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Contents

Fully focused on safe decarbonisation

IACS Members continue their unique contribution to safety and regulation

By Nick Brown, IACS Council Chair

The past 12 months have not been without challenge. The complexities of co-existing with Covid-19 might have lessened their grip but geopolitical events coupled with energy security concerns and a faltering global economy have been testing for us all. This uncertainty has also forced difficult decisions, at times compromising long relationships and shared ambitions.

Unpredictability calls for resilience, resolve, flexibility and collaborative spirit; attributes that are abundant in the maritime industry. And thankfully, 2022 was not all doom and gloom. This year has seen a boost to shipping stocks and a welcome phased return to in-person meetings within IACS and the IMO.

Amid the unsettling geopolitical landscape, our industry has kept its focus on the efforts required by supply chain stakeholders in delivering a safe maritime energy transition. IACS, too, has played its part.

The launch of the new landmark Safe Decarbonisation Panel (SDP) is a hugely important outcome from IACS Member and industry feedback. Establishing the SDP sends the clearest possible signal that IACS is determined to support the industry through the complex challenges of the decades ahead. Giving decarbonisation the same focus as the traditional areas of safety, environment, hull, machinery, survey and cyber significantly enhances IACS' ability to address safe decarbonisation concerns and support the protection of human life, property and the marine environment.

One of the benefits of the SDP is that it enables quick development and publication of common technical requirements for various alternative fuels and technologies being considered by the industry as part of decarbonisation. In this sense, IACS is seeking to ensure that the technical rules which it develops and maintains keep pace with the progress of technological development across IACS Members and the wider maritime industry.

This annual report demonstrates how collaboration between IACS Members is making a unique contribution to maritime safety and regulation through technical support, compliance verification, and research and development. This important work supports safe ships and clean seas globally. ■

Commitment to quality, standardisation, and decarbonisation

IACS continues to support and provide technical leadership to the maritime industry

By Robert Ashdown, IACS Secretary General

2022 saw both an unwelcome increase in geopolitical instability as well as a return to more normalised working and travelling arrangements across much of the world. Both these trends affected IACS.

The sanctions regime arising from the Russian invasion of Ukraine necessitated the withdrawal of the Russian Register from the Association in early March, while, more positively, the easing of pandemic restrictions saw IACS return to a full programme of activity in 2022. That programme included the delivery of a number of important outputs along with the initiation of several important new work streams, as well as a return to physical oversight of the Quality Certification regime that exists for IACS Members.

IACS' ongoing support of the maritime industry and its regulators, together with its Members' unceasing commitment to quality operations, was well reflected in the Association's deliverables in 2022. For one, IACS' Recommendation on EEXI Implementation Guidelines (Rec. No. 172) provided welcome advice on specific elements related to EEXI implementation. Additionally, two new IACS Unified Requirements (URs E26 & E27) on the cyber resilience of ships help ensure the secure integration of both operational and information technology equipment into a vessel's network and also ensure system integrity is secured and hardened by third-party equipment suppliers.

A longer term initiative also came to fruition in 2022 with IACS releasing a new Wave Data Scatter Diagram that will facilitate more accurate estimation of design loads and so contribute to the improved standardisation of safety levels of the fleet *(see pages 18-21)*.

QUALITY FRONT AND CENTRE

Quality matters also received significant attention in 2022 reflecting IACS' ongoing determination to maintain quality standards in the face of the challenges imposed by Covid restrictions while continuing to support initiatives such as the International Quality Assessment Review Body (IQARB), which enables third-party endorsement of IACS' Quality System Certification Scheme (QSCS). Recognising the successful introduction and use of new technologies and approaches initiated to mitigate the impact of pandemic-induced travel restrictions, 2022 also saw IACS deliver its UR on Remote Class Surveys (UR Z29). The core objective of this UR is to ensure the same level of assurance as those performed by a surveyor attending on board the vessel. Recognising the challenges that new technologies and approaches present to quality more generally, IACS also established a dedicated sub-committee of the IACS Council tasked with maintaining QSCS as the gold standard and ensuring its rigorous application.

2022 also saw IACS launch a number of important initiatives designed to support and strengthen our input to IMO and industry discussions in the months, years and decades to come.

DECARBONISATION SUPPORT

Most significantly, IACS established a Safe Decarbonisation Panel (SDP) designed to meet the challenge of ensuring that ambitious targets with expedited timescales for decarbonisation are delivered safely, underpinned by the necessary technical detail, to facilitate early investment by key stakeholders. To help deliver common technical requirements at speed, the SDP immediately convened four project teams to work on ammonia, hydrogen, carbon capture and storage and batteries. This work will help encourage industry to invest in new

fuels and technologies by offering a degree of reassurance that standards are being harmonised and technologies are proven against these requirements.

Also in support of decarbonisation – and building upon an initiative from Tripartite in 2019 – a consolidated matrix on potential alternative fuels and new technologies was jointly developed by IACS and the International Chamber of Shipping to guide the activities of a new, IACS-led, Joint Industry Working Group on Technology Readiness Levels (JIWG/TRL) of alternative fuels and new technologies.

In developing a common understanding of the TRL of low emission technologies, including the estimated capital/operational expenditure for retrofitting and newbuilding, the group will help form part of the pathway to zero-to-low greenhouse gas (GHG) emissions shipping. They will do this by identifying, reviewing and comparing various low emission technologies together with undertaking a review of the readiness of rules and regulations to accommodate these new technologies and identifying any gaps that may exist. Complementing these initiatives, 2022 also saw IACS deliver a steady stream of papers to IMO calling for the adoption of a regulatory framework to support the safe delivery of IMO's strategy on reduction of GHG emissions from ships, providing the necessary background supporting information and offering suggestions for its practical implementation. It is hoped that this body of work will lead to the adoption by IMO of a new output in 2023.

Also with a longer-term horizon in mind, IACS established a Joint Industry Working Group on Future Proofing SOLAS in recognition that the maritime industry is seeing increasing use of novel engineered systems to decarbonise propulsion as a part of the energy transition. With the establishment of this group, IACS has created a forum that can support the maritime industry to adopt new technologies even where their implementation may fall outside the normal requirements prescribed by the Convention.

Managing effectively the work that is necessary to support decarbonisation and digitalisation, both in volume and speed, and ensuring that these new activities are not undertaken at the expense of other, existing work streams requires clear strategic objectives for both the technical deliverables and the process and supporting infrastructure necessary to enable this work. Accordingly, at the end of 2022, IACS Council adopted its new 6-year Plan which encapsulates these tasks with a package of six strategic objectives. These, collectively, provide for a workstream of resolutions that support the maritime industry, deliver industry-leading and demonstrable levels of quality performance and service delivery, reinforce IACS' ability to take a leading role in supporting IMO and other regulatory fora, ensure that IACS' role, scope and visibility meets external expectations, and look to fully digitise the Association in order to optimise the efficient and effective production of IACS outputs.

This review of 2022 clearly demonstrates IACS' capacity to deliver tangible and practical support to the maritime industry in their day-to-day operations as well asserting its technical leadership through the establishment of new fora and processes to cope with short and long-term challenges associated with decarbonisation and digitalisation. By effectively leveraging its new governance arrangements, with the adoption of its new strategic plan, and through ongoing dialogue with its industry partners, IACS continues to deliver successfully on its longstanding and unceasing commitment to safer, cleaner shipping. ■

Innovation and data drive safety progress

Technical support set on clear course of improvement

By Robert Ashdown, Secretary General

As the world re-emerged from the Covid-19 pandemic in 2022, IACS held fast to its central values of leadership, technical knowledge, quality performance and transparency. Innovation, inspection and safety assurance of ships have continued through remote audits, underpinned by data-rich analysis, all towards the goal of safer, cleaner shipping. Protection of lives and the environment continues to be reinforced by IACS Members' technical support for safe operations of ships and other floating structures.

IACS Members' unrivalled expertise and technical understanding of marine structures and stress feed into standard-setting for the entire shipping industry. Through continued partnership with industry and regulators, IACS Members draw on their vast operational knowledge to develop unified technical requirements and produce other recommendations and guidance.

Research and development are central to the development of Rules for classification societies. IACS Members combine in-service and modelling experience to develop Rules for their independent classification societies, and then share best practice findings for the common good of shipping. With classification societies inherently involved in every step of a ship's life cycle, they can also draw on an ever-increasing and rich seam of first-hand data to further promote research and development. Those growing data flows support safety developments, challenging assumptions and evolving thought processes. Findings are then fed back to IACS committees and working groups to enable continued improvement of classification Rules *(see Figure 1)*.

Compliance with international and/or national statutory regulations on behalf of flag State Administrations further strengthens overall safety. Classification societies can be authorised to undertake certification by flag State Administrations, spreading their safety knowledge.

Classification societies do not, however, have control over how a vessel is operated and maintained between the periodical surveys they conduct. Safety, therefore, relies on proper maintenance and operation by shipowners or operators, as well as on the competence of seafarers on board.

Shipowners and operators also have a responsibility to inform their classification society without delay of any defects found that may affect class, or if any damages are sustained. Once aware of those conditions, classification societies have the right to suspend, withdraw or revise class if the conditions for maintenance of class cannot be complied with.

STATUTORY STANDARDS

In its total support for safety, IACS takes its role as technical advisor to the International Maritime Organization (IMO) extremely seriously and draws great value from the symbiotic relationship that it has with shipping's international regulator. This interdependent relationship gives IACS Members direct access to the development of international regulatory instruments and offers a unique channel to share technical information with the industry. IACS also engages with the International Labour Organization in setting statutory requirements for those on board ships.

IACS' development and adoption of Unified Interpretations (UIs) – adopted Resolutions on matters arising from implementing IMO-agreed provisions – support global and consistent implementation of IMO regulations. IACS also establishes, reviews, promotes and develops Unified Requirements (URs) in relation to the design, construction, maintenance and survey of ships on matters directly connected to or covered by specific Rule requirements and practices of classification societies.

At a national level, IACS offers technical expertise to assist regional regulatory bodies, standards organisations and flag State Administrations to develop, implement and interpret statutory regulations and industry standards in ship design, construction and maintenance.

Ship safety and the protection of the marine environment are inextricably intertwined. Working in partnership, fortified by unrivalled expertise, IACS is able to make continuous progress towards its goal of the safe operation of the global shipping industry, regardless of global disruptions. ■

"Members combine in-service and modelling experience to develop Rules for their independent classification societies, and then share best practice findings for the common good of shipping"

Figure 1
The class cycle

IACS VALUES

IACS ascribes to the following values in its assistance to regulators, including the IMO and ILO, and industry:

1. **Leadership:** the ability to be ahead and to co-operate with regulators and industry on initiatives that can effectively promote maritime safety, protection of the environment and sustainability.

2. **Technical knowledge:** collective and individual knowledge and experience leading to the development, adoption and implementation of technical rules and requirements reflecting current practice and changing demands of society, supporting innovation and new technologies.

3. **Quality performance:** commitment of Members to define and adhere to the highest global quality standards; and

4. **Transparency:** the ability to provide advice on the implementation of regulations, interpretations or enhancements thereof, if the need is identified, so that practical solutions can be effectively developed in co-operation and with the support of other stakeholders, increasing the trust on class.

Contributing to shipping's safe decarbonisation

There is an urgency to understanding the safety risks of decarbonisation solutions

By Robert Ashdown, Secretary General

The International Maritime Organization's Initial Strategy on the reduction of greenhouse gas (GHG) emissions from ships set an ambitious target. Since the adoption of that strategy, there have been calls to go further and quicker. To demonstrate social responsibility and to prepare for possible environmental regulations, pilot projects in the maritime sector are now taking place either using alternative fuels, adapting existing technologies, or installing new technological solutions.

To assist with meeting immediate needs, the focus of the IMO has been on LNG as a fuel within the IGF Code as well as other alternatives, including ammonia and hydrogen. Interim guidelines have been developed for fuel cells, among others. IACS is actively working on the detailed technical requirements for such systems and contributing to IMO.

While different organisations have initiated their own work, it is understood that the considerations within the Initial Strategy on the reduction of GHG emissions from ships and the proposals for an accelerated approach assume (however do not directly address) the existence and scalability of alternative fuels and technologies. These are needed across newbuilding activity and must be sufficient to deliver a significant number of zero emitting ships 'on the water' by 2030, just seven years from now.

The successful design and delivery of an ambitious and accelerated GHG reduction policy will have to go 'hand in glove' with the assessment of safety risks to ships, the people operating on board, and the surrounding infrastructure and personnel. The assessment of alternative technologies and fuels will require accepted safety regulations at both goals-based and detailed levels in order to support the design and fabrication of equipment for systems and ships and to enable the integration of those systems and equipment in a safe way. In addition to the technical requirements related to the 'hardware' (power sources, equipment, systems, a ship, etc.), the work will also need to address 'management' aspects (ship and company management, human element, etc.) and the safety management needs related to the operation of systems and ships, as well as safety of people on board and ashore.

As the timescale for decarbonisation becomes increasingly compressed – as time elapses and/or the level of ambition is raised – there is a commensurate urgency to understand associated safety risks and establish an effective assurance arrangement for the safety of decarbonisation solutions. Recognising that urgency, IACS has submitted a number of documents to assist IMO in structuring the discussion and calling for a strategic approach to decarbonising shipping safely. The document to the 32nd session of IMO Assembly (2021) kicked off the call for action, followed by the document to Maritime Safety Committee (MSC) 105 suggesting a particular approach, while the document to the eighth session of the CCC Sub-Committee in September 2022 gave examples of different technological solutions and associated risks, emphasising the strategic policy nature of the necessary discussion.

As a result of subsequent considerations, MSC 106 confirmed the need for action and invited interested Member States to work with IACS on a new output proposal. In that respect IACS believes that in addressing the challenge of safe decarbonisation, IMO should look at a coherent and focused 'safety' approach, identifying the most efficient route for the delivery of actions necessary to achieve the set goal(s). In the process of doing so IMO should consider:

- the different safety risks associated with the delivery of zero carbon-emitting ships along the lifecycle within the shipping industry (e.g. technology development, development of requirements, assessment of technology and its integration on ships, scalability of technology to match newbuilding capacity against the goal, performance of shipboard systems in operation, and finally the survey requirements of ships and their systems); and

- the certainty and clarity of regulations applicable to technical solutions and the necessity for common standards to 'assure confidence' of the proposed technology.

"The successful design and delivery of an ambitious and accelerated GHG reduction policy will have to go 'hand in glove' with the assessment of safety risks to ships, the people operating on board, and the surrounding infrastructure and personnel"

The overall aim is to ensure that safety (and consequential environmental protection) and efficiency of shipping are maintained, and potentially improved, so that the flow of international seaborne trade continues to be smooth and efficient. IACS is under no illusion that the task ahead is complex and requires engagement of all those involved in determining the future of ship design and operation. However, the consequences of not undertaking the needed regulatory assessment could contribute to the proliferation of ships unregulated by international instruments, which may lead to adverse impacts on maritime safety, security and the protection of the marine environment.

IACS intends to actively participate, together with all interested parties, in the work to determine the feasibility of the uptake of the technology/fuel (technology readiness), the state of knowledge of risks, and the technical considerations of solutions based on a review of the results of various trials and projects within a structured process of assessment. This should determine the most appropriate course of action for IMO, Member States and industry. ■

Underlining the importance of quality assessment

Positive developments at IMO as MSC recognises IQARB Factual Statements

By Jonathan Spremulli, Quality Secretary

Last year saw significant developments at the International Maritime Organization (IMO) in terms of recognition of the International Quality Assessment Review Body (IQARB). IQARB, it will be recalled, was established in 2019 to review the certification process of the quality management systems of IACS classification societies. At its fourth meeting in May 2022, IQARB issued to each IACS Member an IQARB Factual Statement demonstrating each society had implemented an effective quality management system (QMS).

Notably, at the eighth session of the Sub-Committee on Implementation of IMO Instruments (III 8), in July 2022, there were discussions for the first time concerning how Member States might potentially use the Factual Statements issued by IQARB as part of their individual Recognized Organization (RO) oversight programmes. There was a proposal from a Member State to include, in the III Code Implementation Guidance being developed by IMO, supportive text that would enable Member States to use IQARB Factual Statements as part of their RO oversight programme to evidence that their ROs had implemented an effective QMS. The suggested text importantly facilitated this use of the Factual Statements by Member States being recognised and accepted in the IMO Member State Audit Scheme (IMSAS). The III Sub-Committee agreed that text could be included in the draft guidance concerning the Factual Statements issued by IQARB considering decisions made by IMO's Maritime Safety Committee (MSC).

Very significantly, at the 106th session of MSC in November following very positive and considerable discussion concerning a major IQARB related submission, MSC 106/14/1, co-sponsored by five Member States and six non-governmental organisations including IACS, MSC agreed:

1. That the IQARB Factual Statements confirming that ROs had implemented an effective quality management system may assist Member States to focus their individual RO oversight programmes on targeted areas and specific matters pertaining to their ships.
2. That the IQARB Factual Statements may be recognised during IMO Member State Audit Scheme audits as part of the oversight programme of ROs implemented by Member States in relation to evidencing that the RO had an effective quality management system in place.
3. To instruct the Correspondence Group on III Code Implementation Guidance of the III Sub-Committee to further consider the matter and prepare aligned relevant text for inclusion in the III Code Implementation Guidance.

The considerable discussion concerning IQARB at MSC 106 and the agreed outcomes reached regarding IQARB Factual Statements are seen to be a major step forward for IQARB in 2022 and of benefit to Member States and ROs. With appropriate text included in the III Code Implementation Guidance we should see administrative burden reduced and safety enhanced through focused RO oversight. ■

2022 QSCS End User Workshop

Being agile in technical development

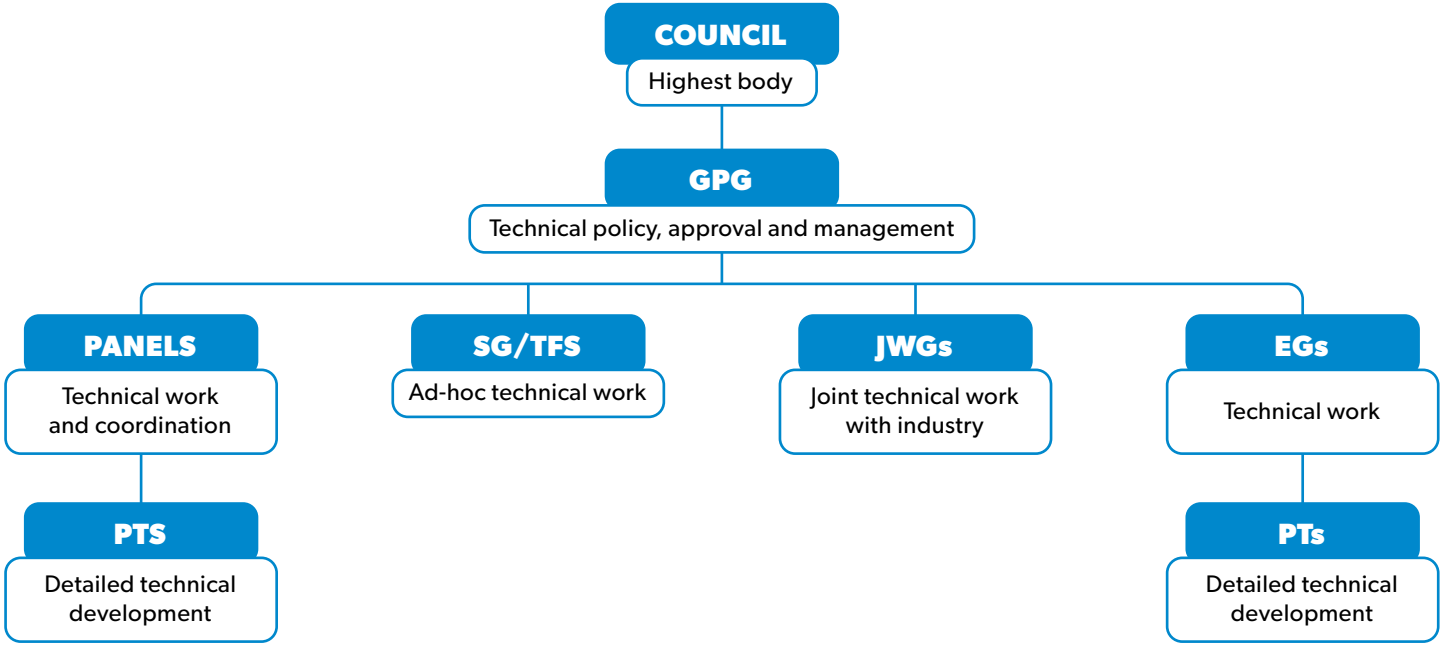
IACS has strengthened its unique role in serving the whole industry and the international regulatory regime

By Zhiyuan Li, Chair, General Policy Group (GPG)

BACKGROUND

IACS' technical work mainly falls into two categories: firstly, to establish, review, promote and develop minimum technical requirements in relation to the design, construction, maintenance and survey of ships and other marine-related facilities; and secondly, to assist international regulatory bodies and standard organisations to develop, implement and interpret statutory regulations and industry standards in ship design, construction and maintenance with a view to improving safety at sea and prevention of marine pollution.

To accomplish this, IACS has established and evolved a unique and well-functioning technical work structure, as reflected in this diagram:



Note: The seventh Panel – the Safe Decarbonisation Panel – was established in mid-2022. SG—Small Group, TF—Task Force, EG—Expert Group, PT—Project Team. All the above groups are supported by the Permanent Secretariat. For details, please refer to the IACS Organisation organigram on page 44.

Returning to normality after the Covid-19 years, 2022 saw plenty of technical outcomes both in terms of volume and impact, thanks to the joint efforts of colleagues within and beyond IACS.

FIGURES

For technical requirements development, GPG approved in total 81 (New/Revision/Corrigenda/Deleted) Resolutions/Recommendations for implementation application by IACS Member Societies. They include 33 Unified Interpretations, 31 Unified Requirements, 6 Procedural Requirements and 11 Recommendations.

To support the IMO in its development, implementation and interpretation of statutory regulations, in 2022, IACS invested a considerable amount of resources into planning, discussing, drafting and submitting up to 83 independent or joint submissions to IMO meetings, and sent 110 experts to attend the meetings of Working Groups, Drafting Groups, and/or Correspondence Groups. (See table below).

In addition to the two main work areas, 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. This year, there have been six IACS position papers newly developed or revised, covering hot issues such as MASS, Cyber Systems, Safety Aspects of Alternative Fuels, and Container Ship Safety.

IACS also has close ties with other inter-governmental bodies such as 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; and co-operates and collaborates on various issues through meetings, joint working groups, liaisons and visits.

To achieve all this, IACS benefits from a large amount of work and time spent by its seven dedicated Panels, nine Expert Groups, and 35 Project Teams, which form the foundation of IACS technical achievements. Note that only the work by Panel Chairs and Secretaries and Project Teams Managers and Members fall within IACS' budget, while 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 budget. The following budgeted man-days – a small portion of the total technical labour involved – indicate the scale of IACS' technical work:

Budgeted Personnel 2022	Total Working Days
Chairs and Secretaries of 7 Panels	2803.45
Managers and Members of 35 Project Teams	3106.66

Panel Chairs will introduce the substantial outcomes accomplished by their panels in subsequent articles; the following provides a summary of some new technical outputs of 2022.

Number of IACS papers submitted to IMO for its meetings held in 2022

IMO Event	Number of IACS Papers	Number of co-sponsored papers	Total Number of IACS Papers	Number of IACS representatives
SDC 8	13	2	15	12
SSE 8	16	5	21	11
PPR 9	6		6	8
MSC 105	4	2	6	11
MEPC 78	4		4	7
NCSR 9	1		1	6
III 8	1	1	2	9
CCC 8	12	2	14	11
MSC 106	4	6	10	16
MEPC 79	4		4	19
Total	**65**	**18**	**83**	**110**

HIGHLIGHTS

IACS Instruments

RCN to CSR 1 Jan 2022 – to harmonise the ship length used in Common Structural Rules (rule length) with that used in GBS (freeboard length), enhance buckling strength requirements in CSR, define the upper limit of intermittent weld leg length, and define corrosion application applied to superstructure as well as application of rules requirements and associated loads for various structural elements.

UR Z29 Remote Classification Surveys – to provide remote classification survey requirements for ships in service.

PR 41 Reporting on existence of asbestos on board – to ensure that the organisation responsible for the issue of PSSC, SAFCON or CSSC of the ship and the flag State Administration are notified when the existence of asbestos on board is identified by another classification society who carries out a survey or audit onboard.

UR E26 Cyber resilience of ships – to ensure the secure integration of both operational technology and information technology equipment into the vessel's network during the design, construction, commissioning, and operational life of the ship.

UR E27 Cyber resilience of onboard systems and equipment – to provide requirements for cyber resilience of onboard systems and equipment and provide additional requirements relating to the interface between users and computer-based systems onboard, as well as product design and development requirements for new devices before their implementation onboard ships.

REC 172 EEXI Implementation Guidelines – for the implementation of IMO EEXI requirements, to address ambiguities identified relating to IMO guidelines supporting EEXI framework.

REC 173 Guidelines on Numerical Calculations for the purpose of deriving the Vref in the framework of the EEXI Regulation.

REC 34 Standard Wave Data – revised with validated wave data combined with ship traffic information including evaluations of bad weather avoidance. Also includes recommendations of vessel speed in adverse seas and effect of heading distribution for direct analyses.

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"IACS benefits from the large amount of work and time spent by its seven dedicated Panels, nine Expert Groups, and 35 Project Teams, which form the foundation of IACS technical achievements"

UI SC 296 Noise level limit in workshops onboard ships – to provide clarity on the noise level limit which is to be applied in workshops not forming part of the engine room.

UI SC297 Amendment to stability/loading information in conjunction with the alterations of lightweight – clarifies which documents need to be updated following a change in the lightweight particulars.

IMO submissions

The table on the right lists some IACS papers in 2022 and their outcomes at IMO:

IACS Paper	**Outcome at IMO**
SDC 8/4/2 *SOLAS XV and the draft IP Code*	The Sub-Committee agreed with the draft new SOLAS chapter XV and the draft new IP Code from the Drafting Group, taking into account IACS proposals in the paper.
SDC 8/13 *Amendments to performance standards for water level detectors MSC 103 PA 1.1**	The Sub-Committee agreed to the revised draft performance standards for water level detectors on ships subject to SOLAS regulations II-1/25, II-1/25-1 and XII/12 (resolution MSC.188(79)/Rev.1).
PPR 9/16 Selection of test cycles	Agreed with modifications.
MSC 105/2/2 *The development of safety requirements at the needed pace and detail to support the achievement of a decarbonisation goal* CCC 8/2/1 *Draft submission to CCC 8 on alternative fuels and technologies*	As discussed at MSC 105, CCC 8 and MSC 106, upon invitation, IACS will prepare a new output for submission to MSC107.
MEPC 78/4 *Clarification on the temporary storage of sewage/grey water in ballast tanks*	The Committee agreed that the temporary storage of treated sewage and grey water in ballast tanks should ensure that ballast water discharges from ballast tanks used also for other purposes would be compliant with the BWM Convention, while other issues associated with this matter should be addressed in the context of MARPOL Annex IV.
III 8/12/1 *Proposal for amendments to the Survey Guidelines under the Harmonised System of Survey and Certification and to the Revised Guidelines on the implementation of the International Safety Management (ISM) Code by Administrations and Proposal for Principles of the Guidelines on remote surveys, ISM Code audits and ISPS Code verifications** III 8/INF.19 *Draft Guidance on remote statutory surveys and draft Guidance for performance of ISM/ISPS/MLC remote verifications*	Both form a basis for further development in the CG.
MSC 106/3/3 *Clarification of terms used in the application requirements of non-mandatory instruments, and the use of "building contract" in both mandatory and non-mandatory instruments**	Agreed
MSC 106/11/4 "Comments on the draft guidelines for lifting appliances and the draft guidelines for anchor handling winches"	Approved in principle

*Joint submission

Meeting between IMO Secretary General and IACS Chair

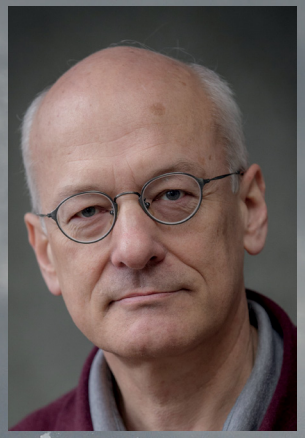
IACS Positions Papers

Six positions papers have been revised/developed in 2022:	
Position Papers	**New/Revision**
MASS	Revision
Ballast Water Management	Revision
Fuel oil safety concerns, associated with the outcome and experiences of the January 2020 implementation of the maximum 0.50% sulphur content limits in marine fuel oils, consumed outside SECAs, are assessed	Revision
Cyber Systems	Revision
Safety Aspects of New Technologies and Fuels	New
Developing and implementing technical measures to reduce GHG emissions from ships	Revision
Container Ship Safety	New

Note: Position Papers can be found on the IACS website at https://iacs.org.uk/about/iacs-position-papers.

In summary, as well as being the year of the tiger, 2022 also proved to be a year of change. The hard work undertaken by IACS colleagues combined with effective changes brought to the internal organisation, have further strengthened IACS' unique role in serving the whole industry and the international regulatory regime, providing many concrete and pertinent technical outputs to meet changing needs.

With a great deal of substantial technical work underway, particularly focused on safe decarbonisation and guided by IACS' newly approved six-year long term strategy, 2023 is a year to truly look forward to. ■



Improved and enriched wave data

Updated scatter diagram will improve wave load calculations for the North Atlantic

By Åge Bøe, IACS Hull Panel Chair

Ships built in compliance with IACS Member classification societies' rules have sufficient strength for trading in the North Atlantic, and the classification rules used to assess the safety of hull structures of ships, are, to a great extent, based on direct calculations, i.e. numerical simulations. The waves that a ship should withstand, together with the operational profile (speed and heading) are crucial inputs to those calculations and are provided in IACS Recommendation No. 34 Standard Wave Data (Rec.34). This is used as a basis for the longitudinal strength of almost all the world's commercial ships as well as for all dynamic loads/motions in the IACS Common Structural Rules for Bulk Carriers and Oil Tankers (CSR). It is also a commonly used reference for direct wave load analysis of ships.

SOLAS II-1/3-10 requires class rules for hull structures of bulk carriers and oil tankers to be based on Goal Based Standards (GBS). A GBS audit of CSR by the International Maritime Organization resulted in an observation, requesting evidence that the wave data used in the rules, based on Revision 1 of Rec. 34, properly represent North Atlantic conditions, inclusive of the possible effects of climate change. To address this observation, IACS undertook comprehensive work from 2018 to 2022 to update this standard, reflecting technical advances and knowledge accumulated over the last two decades. The background of this work was explained in IACS Annual Report 2019.

As this work is finalised, we can now give an overview of the outcome. An updated scatter diagram of wave height and wave period has recently been published in Revision 2 of Rec. 34.

WAVE HINDCAST

IACS received comments on Rec.34 Rev.1 (2001) related to the underlying statistical data, which has its origins in historical 'eyeball' observations from ships. While this data was the best available at the time, studies have demonstrated inaccuracies in human estimates. The effect of weather avoidance was embedded in the data, but it was not possible to quantify. Any bias, for example due to fixed shipping routes or ship types, could not be identified. Furthermore, the last observations included dated back to 1984, so there was also a concern that long term changes were missing.

There has been significant progress since Revision 1 of Rec.34 was published. Numerical hindcast analyses are now common practice, and several reliable global datasets are available. Hindcast wave data are similar to forecasts, only they predict backwards in time. Based on analysis of different datasets, the IOWAGA (Integrated Ocean Waves for Geophysical and other Applications) dataset from IFREMER (Institut Français de Recherche pour l'Exploitation de la Mer) has been used in the IACS work. This data set was chosen

because on comparison it demonstrated good accuracy with buoys and satellite measurements of wave heights in the North Atlantic.

SHIP TRAFFIC

As Rec.34 is supposed to reflect waves encountered by ships it is important to consider realistic combinations of routes and wave data for the North Atlantic. The best way to do this is to combine millions of in-voyage locations with individually co-located wave data. This naturally gives a full representation of the routing effect in a 'routed' scatter diagram. Routing or bad weather avoidance is the action taken to avoid the most severe storms by changing speed or manoeuvring around the storms. Voyages of over 20,000 vessels were established through the cleaning and resampling of AIS data to the same temporal resolution as the hindcast wave data.

Revision 1 of Rec.34 includes recommendations on how ships are assumed to operate in different sea conditions. Equal probability for all ship headings is specified, and zero speed is assumed when evaluating extreme wave loads.

Evaluating the combined AIS-hindcast data, including the entire range of significant wave height (Hs), we observed that the heading profile is equiprobable, as assumed in Rec.34 Rev.1 (Figure 1).

However, looking only at extreme sea-states, the picture is different: beam seas are less likely, as shown in Figure 2. This figure presents the data in the North Atlantic only; using worldwide data provides a similar picture. Two factors can explain this observation:

1. Ship's captains avoid beam seas in harsh weather, to limit roll motion and to avoid stability problems.

2. Harsh weather happens in locations where routes are mostly east-west, with the dominant wave direction from the west.

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Figure 1: Heading histogram, all data

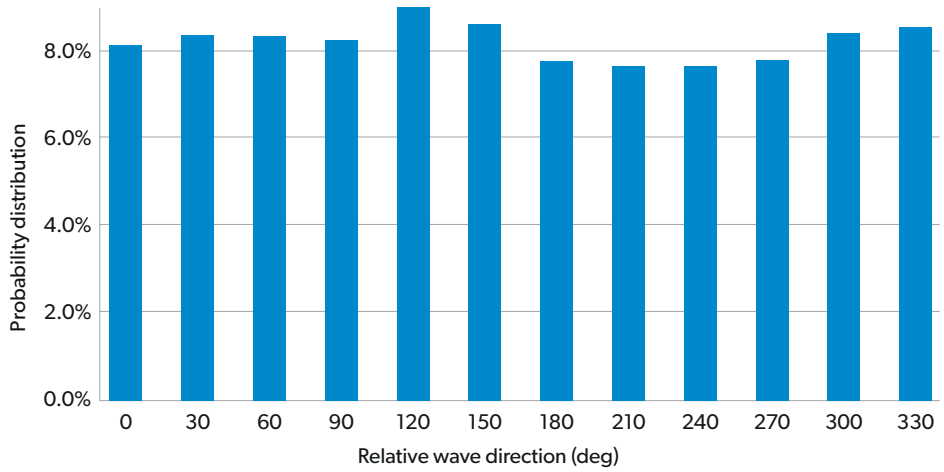


Figure 2: Heading histogram, Hs > 10m

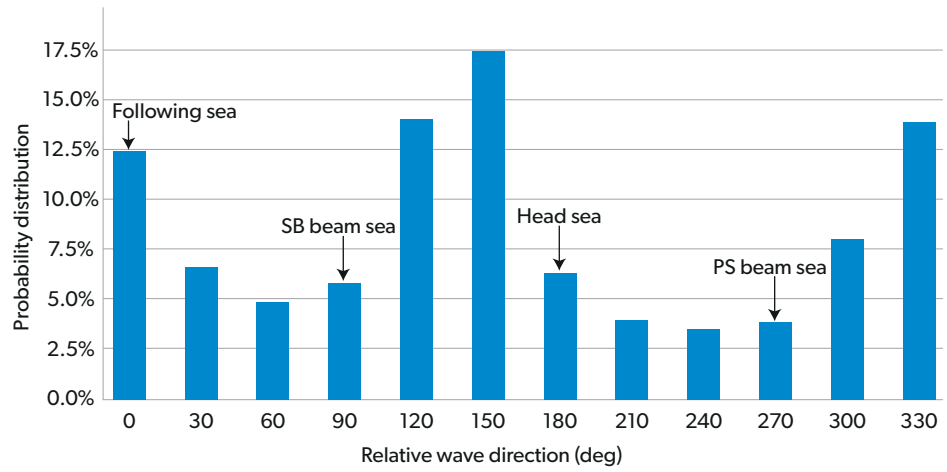


Table 1 Probability of sea-states in the North Atlantic described as occurrence per 100,000 observations

Significant wave height, Hs (m)	Mean wave period, T_{0m1} (s)																Sum
	4.5	5.5	6.5	7.5	8.5	9.5	10.5	11.5	12.5	13.5	14.5	15.5	16.5	17.5	18.5	19.5	
0.5	6.82	202.00	333.61	187.76	45.59	4.74	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	780.73
1.5	0.33	2028.35	12750.82	11693.39	7215.75	3005.80	845.07	160.77	20.53	1.79	0.10	0.00	0.00	0.00	0.00	0.00	37724.81
2.5	0.00	3.38	2805.81	8517.74	7835.85	5885.37	3608.30	1805.81	737.71	246.00	66.96	14.88	2.70	0.40	0.05	0.00	31530.96
3.5	0.00	0.00	23.06	2742.51	4666.81	4100.83	2936.41	1713.38	814.68	315.65	99.66	25.64	5.38	0.92	0.13	0.01	17445.07
4.5	0.00	0.00	0.00	82.06	1759.81	2069.19	1715.42	1151.42	1151.29	625.51	275.12	97.96	28.24	6.59	1.24	0.19	7812.64
5.5	0.00	0.00	0.00	0.08	149.74	811.81	791.81	609.66	375.67	185.26	73.12	23.09	5.84	1.18	0.19	0.02	3027.47
6.5	0.00	0.00	0.00	0.00	1.02	147.59	305.37	271.71	190.23	104.79	45.42	15.49	4.16	0.88	0.15	0.02	1086.83
7.5	0.00	0.00	0.00	0.00	0.00	4.77	88.62	107.20	86.26	53.35	25.36	9.27	2.60	0.56	0.09	0.01	378.09
8.5	0.00	0.00	0.00	0.00	0.00	0.02	9.40	38.70	36.80	25.95	13.63	5.33	1.55	0.34	0.05	0.01	131.78
9.5	0.00	0.00	0.00	0.00	0.00	0.00	0.20	9.34	15.15	12.51	7.39	3.12	0.94	0.20	0.03	0.00	48.88
10.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.81	5.73	5.96	4.08	1.90	0.60	0.13	0.02	0.00	19.23
11.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	1.29	2.68	2.23	1.18	0.40	0.08	0.01	0.00	7.89
12.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	1.01	1.14	0.72	0.27	0.06	0.01	0.00	3.32
13.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.51	0.42	0.18	0.04	0.00	0.00	1.37
14.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.21	0.12	0.03	0.00	0.00	0.57
15.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.09	0.07	0.02	0.00	0.00	0.22
16.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.04	0.01	0.00	0.00	0.08
17.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.01	0.00	0.00	0.04
18.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.02
Sum	7.15	2233.73	15913.30	23223.54	21674.58	16031.12	10301.81	5868.69	2909.77	1230.31	437.79	129.62	31.47	6.11	0.92	0.09	100000.00

In the same fashion, the relationship between ship speed and heading has been investigated. From Figure 3, it is observed that speed in head seas reduces significantly with wave-height. The two most plausible reasons are:

1. Voluntary speed reduction to limit ship motions

2. Involuntary speed reduction due to added resistance in waves.

The speed reduction is strongly dependent on the relative wave heading. Figure 3 shows the speed reduction for each heading. It appears that the reduction is larger in a head sea than in a following sea.

OCEAN AREAS COMPARISON

By comparing ship responses in different ocean areas, IACS can confirm that globally the North Atlantic is the most demanding area. The extent of the North Atlantic is the basis for the updated wave scatter diagram as shown in Figure 4, where coastal areas are removed.

IACS has reviewed the work of the Intergovernmental Panel on Climate Change (IPCC) and found that there is a great deal of uncertainty about the effects relevant to shipping. However, even changes at the highest end of IPCC projections of +/- 0.5m in extreme wave heights for the North Atlantic would be expected to have negligible effect on the Rec.34

Figure 3: Average ship speed as function of Hs and relative wave heading

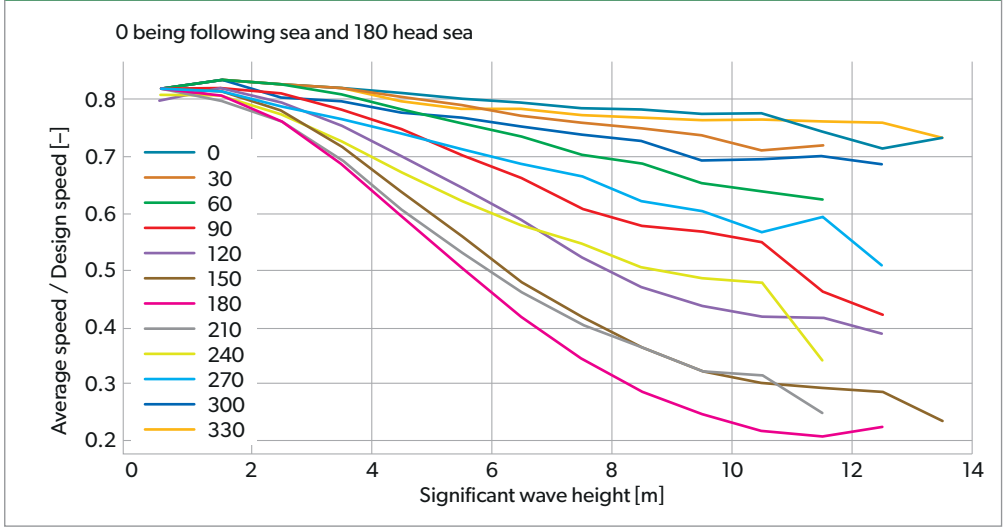
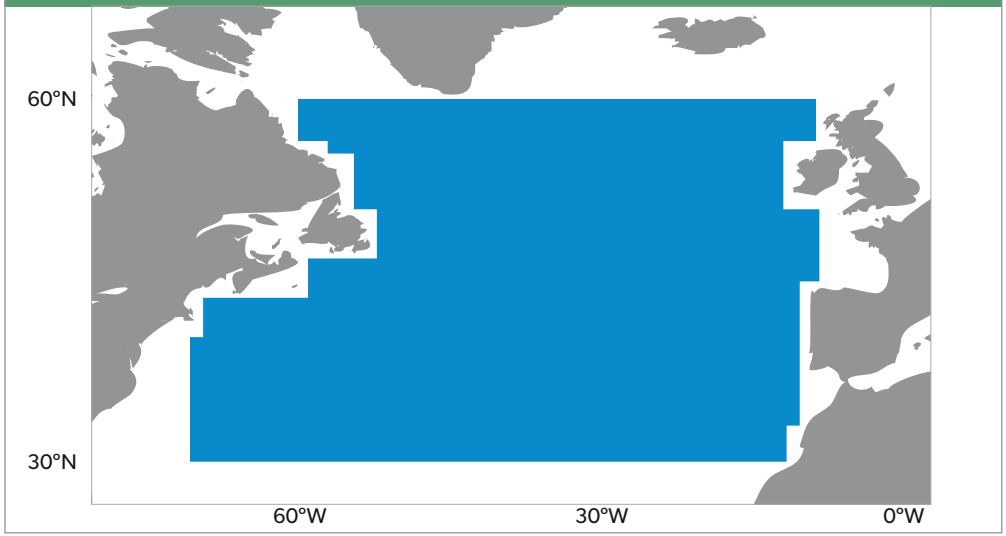


Figure 4: Definition of the extent of the North Atlantic



Rev.2 scatter diagram due to the robustness of the derivation procedure. Furthermore, ships in service will continue to avoid rough weather at the levels encapsulated in the new scatter diagram. Therefore, in effect the Rec.34 Rev.2 scatter diagram includes some futureproofing. The updated wave scatter diagram is shown in Table 1.

Continuing its work on Rec. 34, IACS has started a large project on developing design wave loads based on the updated wave scatter diagram. All wave loads in CSR will be checked, for example, hull girder loads, sea pressures and accelerations. This will result in comprehensive technical background and rule changes, where necessary.

For other ship types, hull girder loads as wave bending moments and shear forces will be considered. If necessary, several IACS Unified Requirements may be revised. Sound and transparent technical backgrounds will also be developed, so the entire process can be traced from the wave environment to wave loads and finally to the consequent assessment of the hull structure. ■

URs address cyber challenges

Requirements cover cyber security core functions – identify, protect, detect, respond and recover

By R Srinivas, IACS Cyber Systems Panel Chair

IACS published Unified Requirements E26 and E27 in 2022 to address the growing concerns of cyber incidents on board ships.

UR E26 specifies unified requirements to ensure cyber resilience in a ship through the implementation of five functional requirements – identify, protect, detect, respond and recover – during ship design, construction, commissioning and operational phases. UR E26 specifies how systems should be integrated, while UR E27 specifies the minimum set of cyber security requirements needed for computer-based systems (CBS) and equipment to achieve cyber resilience.

Validating the need for the development of additional cyber-related requirements, IACS has initiated work covering various phases of a ship's life cycle and for a variety of stakeholders to demonstrate cyber resilience. This could be for manufacturers at their premises, for shipyards during the newbuilding stage, or for onboard crew during the operational phase of the ship.

To address these challenges, IACS Cyber Systems Panel has established a project team to identify a set of new unified requirements which would cover verification activities during the various phases of a ship's life cycle.

The new requirements address four major areas: demonstration of compliance to UR E27 by suppliers; demonstration of compliance to UR E26: newbuilding phase; demonstration of compliance to UR E26: ships in service; and acceptance of alternative standards for navigation and radio communication equipment.

Regarding demonstration of compliance by suppliers, UR E27 includes the cyber security requirements that are applicable to product suppliers. The new work on survey requirements intends to specify how product suppliers can demonstrate compliance with the cyber security requirements in UR E27. The requirements are being developed with an objective of demonstrating the compliance of systems and equipment by the product manufacturer through document assessment and inspection/testing.

Verification activities include plan approval, which requires ship-specific assessment of documents for the CBS. The requirements specify a detailed set of documents, including a description of security capabilities and test procedures that are required to be submitted. However, when the CBS is type approved by the IACS classification society, then reduced documents submission requirements are specified. Verification activities also include survey and factory acceptance testing as a ship-specific verification activity aimed at demonstrating that a CBS complies with the applicable requirements in UR E27 through testing and verification. These include but are not limited to verification of security capabilities and configuration, software development life cycle, and change management and will be carried out at a product supplier's premises.

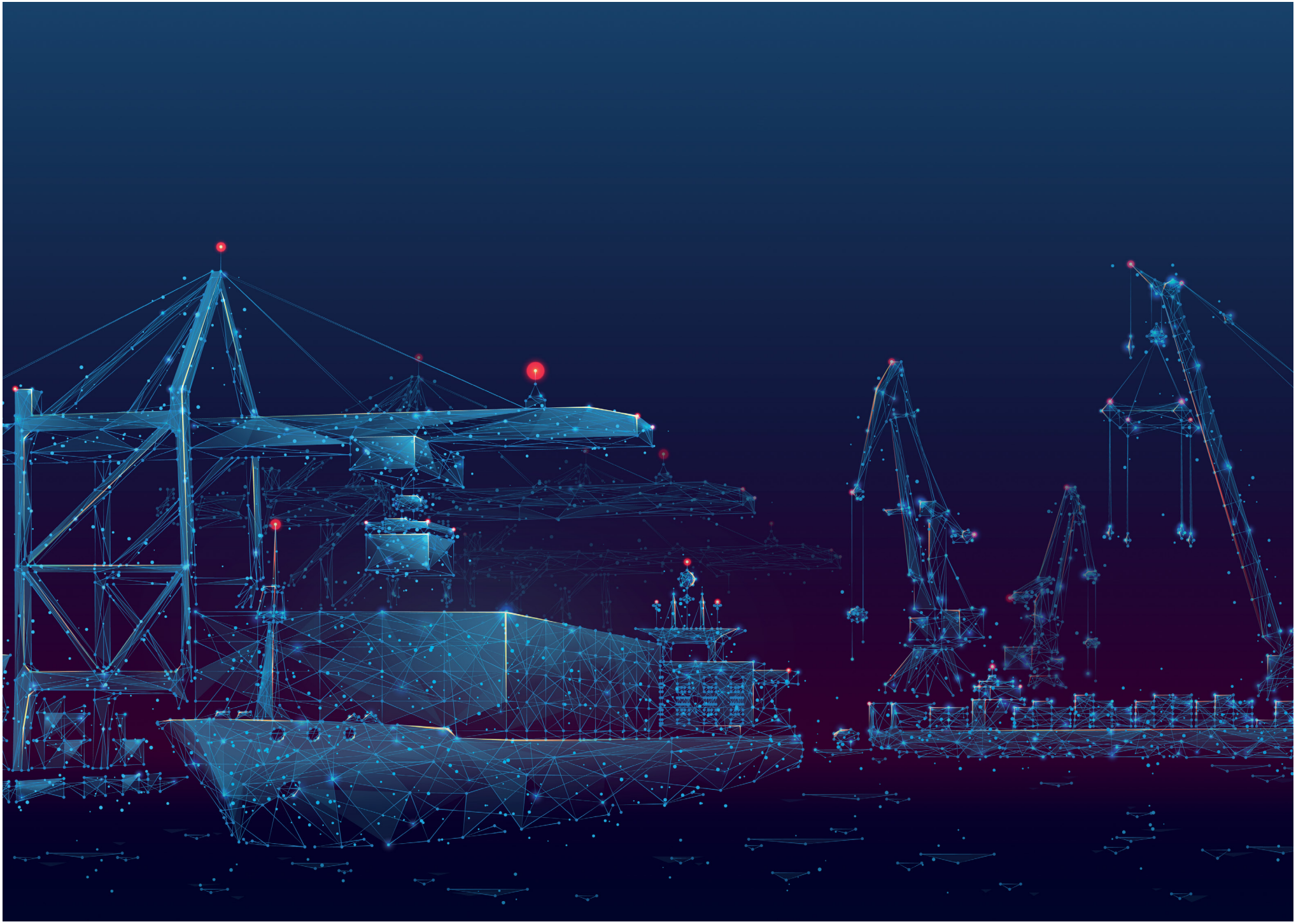
For demonstration of compliance in the newbuilding phase, security zones are one of the key concepts of UR E26. The main benefits of security zones, network segmentation and protection of zone boundaries are to reduce the extent of the attack surface, prevent attackers from achieving lateral movement through systems, and improve network performance. The new survey requirements under development are aimed at verification of compliance to UR E26 and specify the verification activities of integration, architecture and implementation of cyber security barriers of cyber physical systems coming under the scope of classification. The requirements specify methods for verification of systems from the document stage to onboard testing during newbuilding stage.

The requirements broadly address:

- The documentation required to be submitted by the shipyards and system integrators; and
- Survey requirements which specify how to test various security aspects.

In service, meanwhile, is viewed as one of the most important phases in a ship's life cycle. It is in this phase where a ship's crew is required to demonstrate continual satisfactory operation of the cyber systems without the support of OEMs, system integrators and the shipyard. A minimum set of requirements are being developed, through which the ship's crew can demonstrate to the attending surveyor that the security countermeasures are maintained during operation of the ship.

The new work also addresses the requirements to be complied with where navigation and radio communication systems are designed as per IEC 61162-460 and are used as an alternative to UR E26 and UR E27. The new survey requirements will provide clarification of acceptance criteria, compensating countermeasures, test methods, and the application of alternative standards for navigation and radio communication equipment. ■



Engaged in ballast water developments

IACS involved at every stage of Convention's introduction

By Li Lu, IACS Environmental Panel Chair

The IMO's International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004 (the BWM Convention) entered into force on September 8, 2017. Its implementation marked the beginning of global ballast water management.

Recognising that challenges may arise during the implementation of the convention that were not foreseen at the time of its adoption, the shipping industry expressed its concerns regarding the potential penalisation of shipowners and operators during implementation due to non-compliance with the performance standard of the Convention for reasons beyond the control of the shipowner and ship's crew, as well as the need to protect the environment, human health, property and resources from the discharge of harmful aquatic organisms and pathogens in any non-compliant ballast water.

In response to these concerns, the 71st session of the IMO's Marine Environment Protection Committee (MEPC 71) agreed to establish an experience-building phase (EBP), starting from the entry into force of the Convention and ending with the entry into force of the package of priority amendments, with a view to monitoring implementation to identify aspects that were working well and to highlight issues that required further attention.

During the ballast water experience-building phase, a ship would not be penalised (sanctioned, warned, detained or excluded) solely due to an exceedance of the ballast water performance standard described in regulation D-2 of the Convention following the use of a ballast water management system (BWMS), provided that the preconditions associated with the non-penalisation measures had been met (for example, approval, installation and maintenance of the BWMS).

The EBP was structured as three stages: a data gathering stage, a data analysis stage, and a Convention review stage. Following MEPC 71, the Committee adopted a Data Gathering and Analysis Plan (DGAP) through BWM.2/Circ.67 to guide the first two stages of the EBP at MEPC 72.

STATUS AND ISSUES TO BE FURTHER CONSIDERED

As expected, a number of issues arose during the EBP. Some issues have been addressed, such as validation of the compliance of individual BWMS with regulation D-2 of the BWM Convention in conjunction with their commissioning. MEPC 73 approved BWM.2/Circ.70 on 'Guidance for the Commissioning Testing of Ballast Water Management Systems', and the Committee approved the draft amendments to regulation E-1 of the BWM Convention at MEPC 74.

However, there are still many other issues that have been identified by Members States or the industry and raised at MEPC.

Some concerns were raised by industry and Members States regarding the challenges faced by certain specific ship types – for example unmanned non-self-propelled barges, ships designed and used for emergency response, search and rescue, oil spill response and emergency towing – due to their design and operational characteristics. Taking into account the specific structural characteristics of salvage ships, the installation of a BWMS on board is sometimes not physically possible or will inevitably lead to negative consequences and disruption of those ships' main functions. To ensure the full functionality of those types of ships, amendments to regulations A-4, A-5 or the Guidelines for ballast water management equivalent compliance (G3) were proposed.

However, there are counter views that making amendments based on specific ship types risked fragmentation of the Convention and that such amendments made prior to the end of the EBP risked pre-empting the results of the EBP. These might then lead to implementation issues being addressed in an uncoordinated manner.

Some ships, meanwhile, reported the issue of how challenging water conditions affected the effectiveness of BWMS, including BWMS failure, operating at a reduced treatment rate, and the need to be bypassed due to physical limits/failure or system design limitation exceedance. As a result of this issue, draft guidance for the application of the BWM Convention to ships operating at ports with challenging water quality was submitted to IMO, and, after discussion, fundamental elements on this matter were identified for further discussion.

It should be noted that an overarching point was whether such situations should be considered as contingencies that could be addressed through a revision of the Guidance on contingency measures under the BWM Convention (BWM.2/Circ.62) or as operational matters to be addressed through new stand-alone guidance, on which the views were split. Some Member States supported the practice of ballast water exchange plus treatment (BWE+BWT) as a good approach in such situations while other Member States expressed the view that this practice should only be a last

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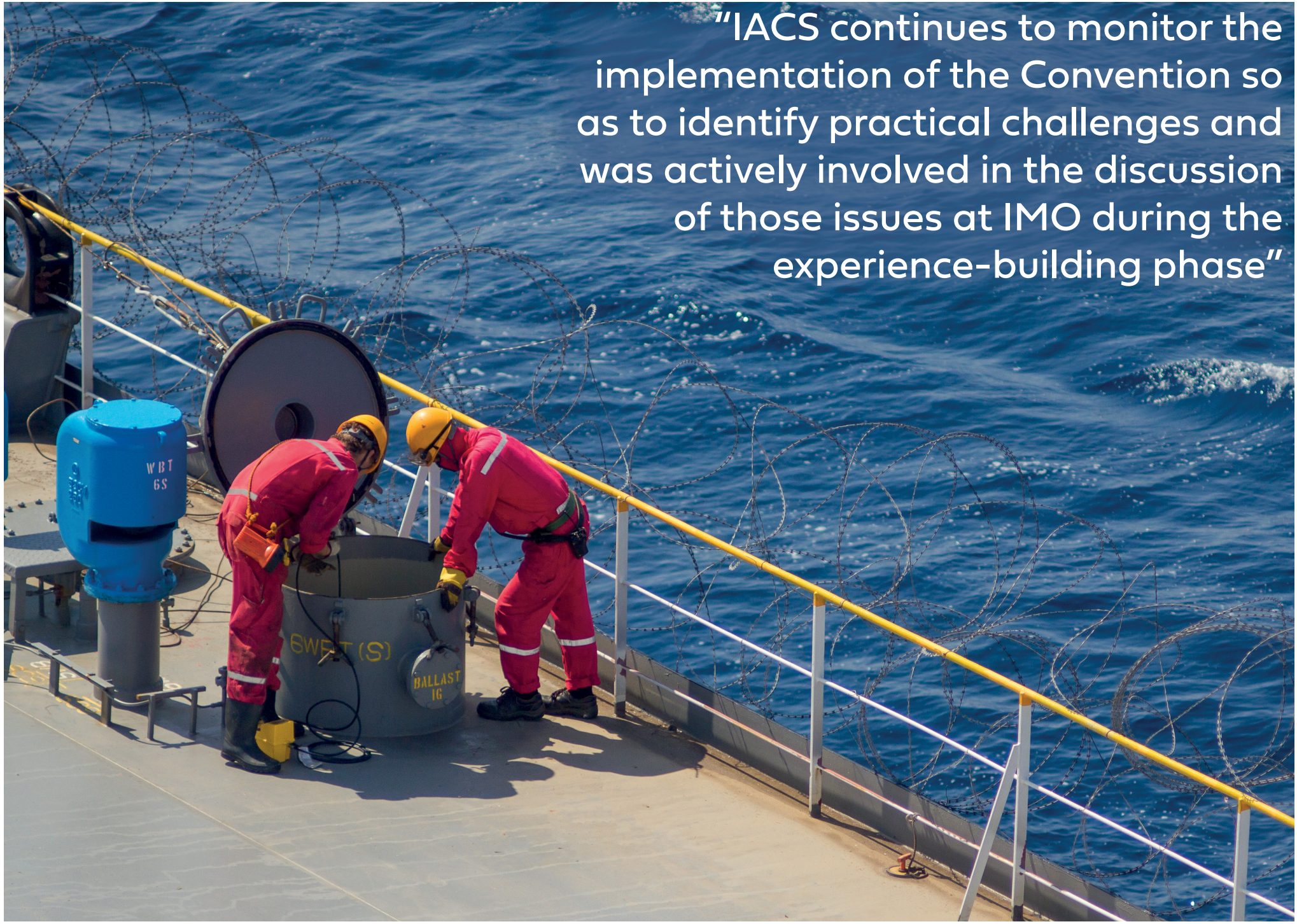


"IACS continues to monitor the implementation of the Convention so as to identify practical challenges and was actively involved in the discussion of those issues at IMO during the experience-building phase"

resort and conducted under certain criteria including the locations where BWE could be undertaken.

IACS also identified the issue of temporary storage of treated sewage and grey water in ballast tanks and raised this at MEPC 78. Due to Port State requirements for the discharge of sewage and grey water, more and more ships in service have an urgent need to store treated sewage or grey water in a ballast tank. Some ships have had modifications or conversion of their ballast tanks to temporarily store treated sewage and grey water.

IACS Members have been receiving a significant number of requests for case-by-case decisions confirming the manual transfer of grey water and treated sewage to the ballast tanks, due to the requirements in some ports. With requests from the industry and communications with relevant flag State Administrations, some agreements on a case-by-case basis have been provided to ships.

IACS considers that the temporary storage of grey water or treated sewage in the ballast tanks is not prohibited by either the BWM Convention or MARPOL Annex IV. However, due to the different understanding of such practice, IACS believes that the issue of temporary storage of grey water and treated sewage in the ballast water tanks should be addressed at the IMO level.

In connection with this, IACS has provided general principles for the arrangements for the temporary storage of grey water or treated sewage in the ballast water tanks and some technical and operational points for addressing the issue. IACS brought the issue to the attention of the MEPC 78 with suggestions, which offered a basis for further consideration towards a possible solution.

MOVING TO THE REVIEW PLAN PHASE

In addition to the above issues, it is recognised that many other issues of consequence have arisen during the EBP, including areas for improving BWMS performance and reliability, crew training and maintenance, and the potential to verify BWMS performance outside of Port State Control. The Committee agreed that starting the development of the Convention Review Plan is the most effective way forward with a view to a holistic review of the BWM Convention, taking into account the outcome of the data gathering and analysis stages of the experience-building phase.

Recognising that classification societies are regarded as a potential source of complementary data for the EBP in BWM.2/Circ.74, IACS was invited to participate in the EBP data collecting process. IACS considered the request, consolidated data in accordance with BWM.2/Circ.67/Rev.1 and provided them to the World Maritime University for the final report to MEPC 78. Moreover, IACS continues to monitor the implementation of the Convention so as to identify practical challenges and was actively involved in the discussion of those issues at IMO during the experience-building phase.

IACS also participated in the IMO Correspondence Group on Development of a Protocol for Verification of Ballast Water Compliance Monitoring Devices and IMO Correspondence Group on Review of the BWM Convention (CRP). Over three years, IACS submitted seven papers to the IMO Sub-Committee on Pollution Prevention and Response and the Marine Environment Protection Committee, covering the following areas:

- Comments on the draft protocol for the verification of ballast water compliance monitoring devices (CMDs) (PPR 8/11/2)
- Proposed unified interpretation of regulations E-1.1.1 and E-1.1.5 of the BWM Convention (MEPC 77/4/6)
- Proposed unified interpretation of regulation B-3.10 of the BWM Convention (MEPC 77/4/11)
- Proposed unified interpretation of appendix I to the BWM Convention (PPR 9/16/2)
- Clarification of the temporary storage of treated sewage and grey water in the ballast tanks under the BWM Convention (MEPC 78/4)
- Proposed unified interpretation of paragraph 4.10 of the BWMS Code (MEPC 79/4/6)
- Clarification of a commissioning test of a BWMS which has undergone major modification or upgrade onboard an existing ship (MEPC 79/4/7)

Some of those proposals were adopted and some of the proposals were taken into further consideration.

A new IACS Project Team has been established to consider the issues related to the implementation of the BWM Convention and to develop IACS guidance on the commissioning testing of the BWMS.

SAFETY OF SHIPS

Meanwhile, IACS has developed and implemented IACS Resolutions for uniform implementation for IACS Members to prevent the safety of ships being impaired due to the installation/operation of BWMS.

IACS Unified Requirement (UR) M74 'Installation of Ballast Water Management Systems' has been developed and published. The UR covers the following aspects of BWMS:

- Categorisation of BWMS technologies and identification of the potential hazards for each BWMS category
- Extension to all BWMS categories (arrangement of a single BWMS on tankers)
- Clarification of the applicability and scope of risk analysis and classification certification
- Tackling the issues raised by the challenge of retrofit installation onboard existing ships

A new IACS UR F45 addressing the safety requirements of BWTS was published in June 2021 and entered into force on July 1, 2022. This new UR has sections covering fire categorisation, BW management room location, fire-fighting and prevention, ventilation and personal equipment.

Additionally, IACS UR Z17 'Procedural Requirements for Service Suppliers' has been updated to include qualification requirements of service suppliers for BWMS commissioning tests.

IACS will continue to provide technical opinions and suggestions based on its expertise and knowledge for safe and uniform implementation of the BWM Convention and relevant Code as well as associated technical guidelines. ■

IACS keeps pace with supplier progression

Revisions to UR tighten approval and certification requirements

By Jaehyeon Ko, IACS Survey Panel Chair

Since its introduction in 1997, IACS Unified Requirement Z17 has evolved to keep pace with the rate of change in firms providing testing and maintenance services to ship safety systems and equipment. The UR sets minimum requirements for approval and certification of those service suppliers.

This UR applies to the approval of the following categories of service suppliers:

- Firms engaged in servicing inflatable liferafts, inflatable lifejackets, hydrostatic release units, inflatable rescue boats, marine evacuation systems.
- Firms engaged in inspections and testing of radio communication equipment.
- Firms engaged in inspections and maintenance of self-contained breathing apparatus.
- Firms engaged in annual performance testing of Voyage Data Recorders (VDR) and simplified Voyage Data Recorders (S-VDR).
- Firms engaged in sound pressure level measurements of public address and general alarm systems on board ships.
- Firms engaged in inspections of low location lighting systems using photo luminescent materials and evacuation guidance systems used as an alternative to low-location lighting systems.
- Firms engaged in maintenance, thorough examination, operational testing, overhaul and repair of lifeboats and rescue boats, launching appliances and release gear.
- Firms engaged in inspection, performance testing and maintenance of Automatic Identification Systems (AIS).
- Firms engaged in Commissioning Testing of Ballast Water Management System (BWMS).
- Firms engaged in thickness measurements on ships or mobile offshore units.
- Firms carrying out an in-water survey on ships and mobile offshore units by diver or Remotely Operated Vehicle (ROV).
- Firms engaged in inspections and maintenance of fire extinguishing equipment and systems.
- Firms engaged in tightness testing of closing appliances such as hatches, doors etc. with ultrasonic equipment.
- Firms engaged in measurements of noise level on board ships.
- Firms engaged in the examination of Ro-Ro ship's bow, stern, side and inner doors.
- Firms engaged in testing of coating systems.
- Firms engaged in tightness testing of primary and secondary barriers of gas carriers with membrane cargo containment systems for vessels in service.
- Firms engaged in survey using Remote Inspection Techniques (RIT) as an alternative means for Close-up Survey of the structure of ships and mobile offshore units.
- Firms engaged in Cable Transit Seal Systems inspection on ships and Mobile Offshore Units.

In the most recent revision, the UR has been developed to re-consider firms engaged in cable transit seal systems inspection on ships and mobile offshore units and firms engaged in commissioning testing of Ballast Water Management Systems (BWMS).

When the bulkhead of an enclosed space penetrated by a multi-cable has not been properly sealed, the flood of one space can lead to the flood of another space. If the flooded space is adjacent to the machinery spaces, this may lead to severe damage. To improve the safety of ships and mobile offshore structures, measures to document and manage the installation, maintenance and repair of MCT (Multi-Cable Transit) seal systems were suggested in the latest revision of UR Z17. By improving documentation during the initial installation, incorporating the installation information into a systemised maintenance plan, and using knowledgeable authorised and/or approved service entities to conduct inspections, the risks of MCT failures are expected to be reduced. This will mitigate potential safety and environmental incidents as a result of service oversights and exposure to onboard flooding conditions.

Any service supplier who is engaged in inspections of watertight cable transit seal systems shall be qualified in these inspections for each make and type of equipment for which

"In the most recent revision, the UR has been developed to re-consider firms engaged in cable transit seal systems inspection on ships and mobile offshore units and firms engaged in commissioning testing of Ballast Water Management Systems (BWMS)"

they provide the inspection. He/she shall also provide manufacturer's documentary evidence that they have been so authorised or they are certified in accordance with an established system for training and authorisation.

The revisions state that personnel for the work shall be trained and qualified in the inspection for which they are authorised, for each make and type of equipment for which they provide the inspection.

A Cable Transit Seal Systems Register shall be prepared by the shipbuilder for watertight cable transits, which could be in either a hard copy or digitised medium. Included should be a marking/identification system, documentation referencing the manufacturer manual(s) for each type of cable transit installed, the Type Approval certification for each type of transit system, applicable installation drawings, and a recording of each installed transit documenting the as-built condition after final inspection in the shipyard. This is to include sections to record any inspection, modification, repair and maintenance.

Once the inspection is completed, the service supplier shall issue a report to confirm the condition of the watertight cable transit seal system and the inspection results shall be recorded in the Cable Transit Seal System Register.

BALLAST WATER DEVELOPMENTS

The Marine Environment Protection Committee (MEPC) adopted Amendments to regulation E-1 to the BWM Convention including commissioning testing of Ballast Water Management Systems (BWMS) at its 75th session which was held in November 2020.

The Amendments to regulation E-1 regarding commissioning testing were applied on or after 1 June 2022 and the Guidance for the Commissioning Testing of Ballast Water Management Systems (BWM.2/Circ.70/Rev.1) can now be taken into account when testing.

MEPC agreed that compliance with regulation D-2 of the BWM Convention, 2004, should be validated in conjunction with the commissioning testing of an individual BWMS and approved the Guidance for the Commissioning Testing of BWMS (BWM.2/Circ.70/Rev.1), stipulating that the performance of the BWMS newly installed on ships should be validated by the flag State Administrations or Recognized Organizations acting on their behalf by demonstrating that its mechanical, physical, chemical and biological processes are working properly before issuing the International Ballast Water Management Certificate.

When reviewing the Guidance, IACS agreed to the benefits of developing a unified approach towards the required qualifications for the service suppliers carrying out sampling and sample analysis, and UR Z17 was updated accordingly.

The extent of engagement of service supplier is through sampling and analysis of ballast water and verification of the self-monitoring equipment during the commissioning testing of BWMS for statutory purposes.

As per the updated UR Z17, service suppliers are to have documented procedures, including:

- Procedures for sampling, collection, handling, analysis and assessment of BWMS, and correct operations, documenting and reporting. The procedures are to outline how the ballast water sampling and analysis are conducted with respect to each size class of organisms; and

- Operating procedures for the ballast water test equipment specified, including calibration, adjustment and maintenance.

Furthermore, UR Z17 specifies that service suppliers are to be familiar with BWMS operation, including features and limits of each treatment technology and self-monitoring parameters. In addition, they are to be independent of the BWMS manufacturer or supplier including shipyard. Lastly, they are to provide reports detailing the results of the sampling and analysis of ballast water and assessment of self-monitoring parameters during commissioning testing. ■


KR
KOREAN REGISTER

Industry's decarbonisation in safe hands

Safe Decarbonisation Panel tackles safety challenges

By Carlo Aiachini, IACS Safe Decarbonisation Panel Chair

The International Maritime Organization (IMO) adopted an Initial Strategy on the reduction of greenhouse gas (GHG) emissions from ships in 2018. The Initial Strategy envisages for the first time a reduction in total GHG emissions from international shipping. GHG emissions must reduce, as a total annual emission, by at least 50% by 2050 compared with 2008. At the same time, efforts towards phasing them out entirely must be pursued.

Technological innovation and the global introduction of alternative fuels and/or energy sources for international shipping will be key factors for acheiving the ambitious overall target.

Along with the development of new technologies and the adoption of low-flashpoint and zero or low-carbon fuels, the maritime industry is seeking practical, technical, and operational standards to address the relevant safety aspects. IMO has already developed some safety requirements regarding the use of low-flashpoint fuels and gases, notably the IGF Code – and its Part A-1 applicable to ships using liquified natural gas (LNG) as fuel, and the Interim Guidelines for the safety of ships using methyl/ethyl alcohol as fuel.

IMO is developing further instruments to address the safety aspects of emerging technologies and alternative fuels, in support of its decarbonisation agenda.

However, these IMO instruments are not expected to be available for some years, with mandatory requirements not expected to enter into force any earlier than 2028.

Continuing its support of the industry in its effort towards decarbonisation, in April 2022 IACS established a Safe Decarbonisation Panel to deal with the technical items related to safety issues for the development, application and use of alternative energy sources and technologies on board ships. The Panel is comprised of one representative from each IACS Member society.

Identification of possible safety issues and the development of related requirements for loading, storage, handling and use of novel fuel onboard, including handling of leakages, are part of the Panel's scope of work, which also includes the identification of gaps in the current regulations and requirements related to human element issues.

The Panel selected hydrogen, ammonia, electrical energy storage systems, and carbon capture as priority items, and established four project teams, each dedicated to one of the selected fuels or technologies, to carry out activities in a more efficient way.

Also, in recognition of the novelty of the fuels and technologies and the low readiness levels (since technologies are still being developed), the Safe Decarbonisation Panel liaises and co-operates with industry partners (such as shipowners' associations, suppliers' industry associations, standardisation bodies, academic institutions, and individual experts) at both project team and Panel levels.

The collaboration with external parties, while not completely new to IACS, is carefully managed to address the sensitive issues of IACS independence and intellectual property rights.

IACS is committed to ensuring its continued role of independent regulatory body, capable of producing requirements properly balancing the interests of designers, shipyards, owners, operators, users, and the general public.

To address the aspect of the intellectual property rights, IACS considers that – in this context – high-level information is generally sufficient to support the development of safety requirements for classification and regulatory purposes. Only in a few specific cases will more in-depth knowledge be needed.

Collaboration with external entities is planned for different stages:

- Through direct contacts between the project teams and selected experts from industry, where confidential information may be shared under proper non-disclosure agreements; and
- By means of Joint Industry Working Groups managed by the Panel itself, where all categories of stakeholder will be invited to contribute.

The panel has nominated IACS' representatives to liaise with other international organisations. These are:

- The IMO Correspondence Group on the development of Technical Provisions for Safety of Ships using Alternative Fuels;
- The ISO TC8 WG8 on Liquid and Gas fuelled vessels;
- The EU Renewable and Low Carbon Fuels Value Chain Alliance;
- The EU European Sustainable Shipping Forum – Sustainable Alternative Power for Shipping (ESSF-SAPS); and
- EMSA's workstream on battery systems on board ships.

Finally, the Panel is considering and discussing the difficulties that flag State Administrations face in approving novel ship design and arrangements, in the absence of applicable internationally recognised regulations.

The use of low flashpoint fuels such as methyl/ethyl alcohols and hydrogen is currently regulated by the IGF Code, referred to in SOLAS Part G. For fuels other than LNG, however, only the Goal, Functional Requirements and the General Requirements given in Part A of the IGF Code apply. These include little more than general principles and the requirement to carry out a risk assessment with details of the risks and their mitigation measures to be documented to the satisfaction of the flag State Administration.

This risk assessment process brings complexity, repetitiveness and uncertainty, because, in the absence of applicable standards, each flag State Administration will consider the matter in light of its own principles, possibly drawing different conclusions that might subsequently result in Port State Control problems for the ship.

The IACS Safe Decarbonisation Panel is considering this aspect and plans to propose a way forward to simplify the process and bring more certainty to the industry. ■

Driving quality forwards at a time of change

Quality remains at the forefront of IACS Members' minds

By Jonathan Spremulli, Quality Secretary

As the world returns to the 'new normal', as the impacts of the pandemic subside in most areas of the world, we look to the future and reflect on some significant changes and developments in 2022 that relate to the IACS Quality System Certification Scheme (QSCS).

QSCS, and the Quality Management System Requirements (QMSR) that are required to be met, is recognised as the 'Gold Standard' for the internal quality management systems of classification societies. All IACS Members are required to fully comply with QSCS; this has been the case for 30 years. The quality of essential services delivered by IACS Members ensuring the safety of ships and preventing pollution at sea is underpinned by ongoing compliance with a QSCS that is effectively developed and implemented.

The IACS Quality Secretary promotes the effective operation of QSCS. A significant development in 2022 is that the baton of Quality Secretary was passed to me by my predecessor Peter Williams who retired in May 2022. Peter held the position of Quality Secretary for nearly 18 years before retiring. He ensured the continued robustness, consistency, and integrity of the scheme at all times throughout this period. During this 18-year period we have seen the auditing and certification against QSCS being passed over to Accredited Certification Bodies (ACBs), the formation of the Quality Assessment and Certification Entity (QACE), the introduction of the III, ISM and RO Codes and, most recently, the development of the International Quality Assessment Review Body (IQARB). Peter is thanked for his excellent work during his tenure as Quality Secretary and his undoubted contribution to the quality of IACS Member services and the safety of shipping.

In addition to the change of Quality Secretary, in 2022 Łukasz Korzeniewicz, of the Polish Register of Shipping, was appointed Chair of the IACS Quality Committee, and John Hannon of the US Coast Guard was appointed as Chair of the Quality Advisory Committee (AVC).

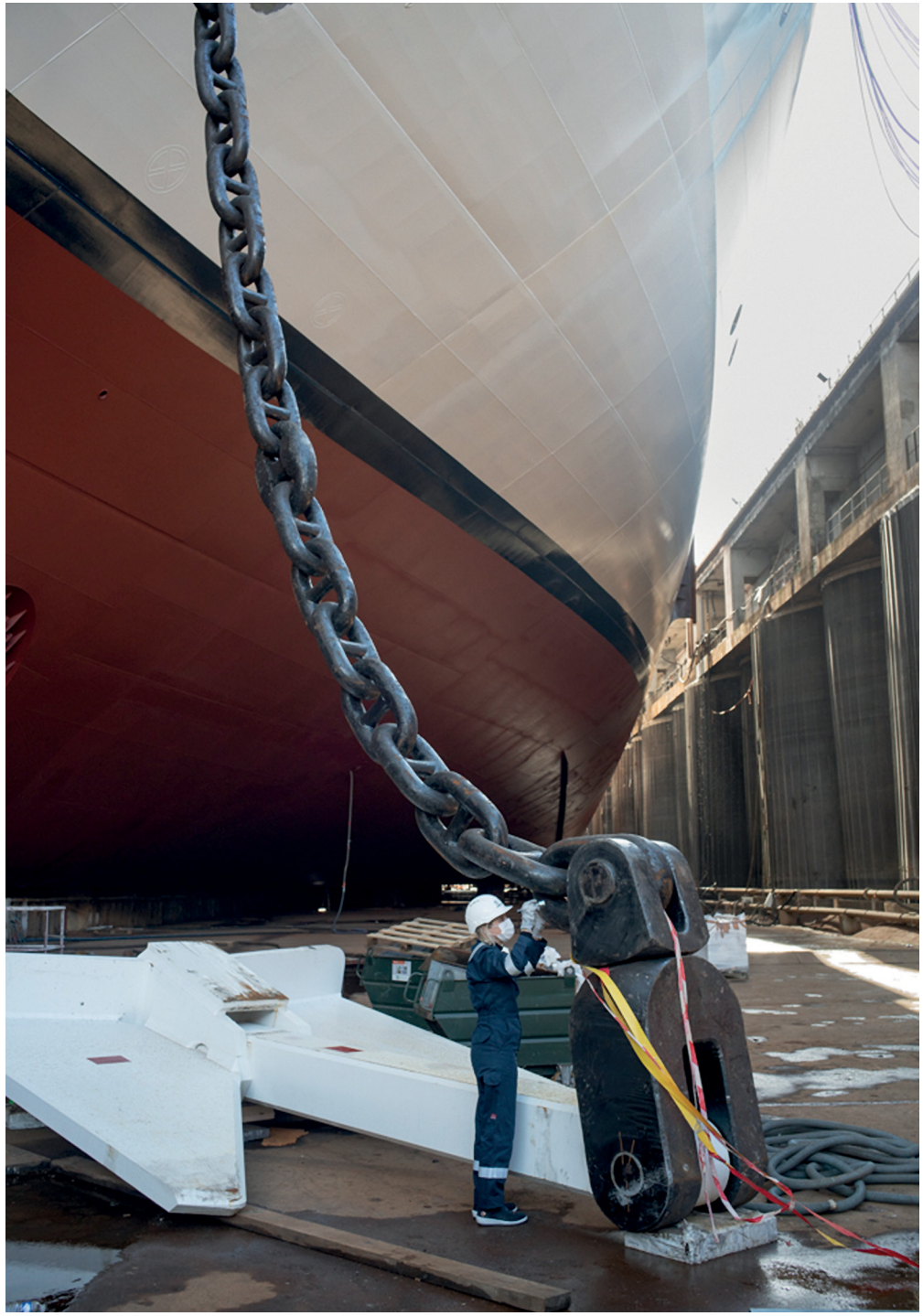
CONTINUED COMMITMENT

Quality continues to be one of IACS' four pillars, along with leadership, technical knowledge, and transparency. Quality has been included as a strategic focus area in IACS' new long-term strategic plan. In recognition of the importance IACS attaches to quality operations it has had significant discussions concerning the structure and composition of quality-related bodies within IACS with the aim of ensuring quality remains at the forefront of minds and has the active participation of IACS Council Members.

With respect to developments in QSCS, considerable work was carried out in 2022 by IACS to ensure the continued effectiveness and robustness of QSCS. This work considered operational feedback and the views of stakeholders, including the AVC. The work resulted in amendments to the IACS Procedures Volume 3 QSCS on subjects which include the role and powers of the Quality Secretary and the IACS Operations Centre in its oversight of the implementation of the scheme, audit planning and observation and audit team composition and rotation.

During 2020 and 2021 the Covid-19 pandemic and related restrictions had a significant impact on many areas of the marine industry, and this included the ability to conduct QSCS Vertical Contract Audits (VCAs) relating to surveys of ships in service, ships under construction and surveys of machinery and equipment. Unlike office audits, VCAs could not be done remotely

"Quality has been included as a strategic focus area in IACS' new long-term strategic plan"



and we saw the numbers of these audits drop to between 25% and 33% of the figures pre-Covid in 2019. It is therefore very pleasing to see that the number of VCAs conducted in 2022 returned almost to the levels of 2019 with the ability to conduct audits in most locations. We hope that in 2023 the last few locations where travel is severely restricted due to Covid-19 measures will see measures lifted, and we will once again be able to conduct VCAs in China, for example.

We should highlight at this time the dedication of auditors and those involved in QSCS in relation to their ability to conduct and facilitate so many on-site audits during the past three years and to the resourcefulness of those involved in facilitating remote audits – an area of auditing where much has been learned and improved upon.

Finally, it is pleasing to report that the 14th IACS' annual QSCS End User Workshop took place in London as an in-person meeting at the end of November 2022. This was the first time since 2019 that this group, bringing together QSCS stakeholders including representatives of Member States, ACBs, class societies and many others, had been able to meet and discuss in-person developments relating to QSCS, IQARB and QACE. The benefit of the in-person nature of the workshop was evident from the level of discussion both in session and in the margins and from the positive feedback received. ■

IQARB delivers conclusive proof of concept

Next phase considers expansion of advisory body's oversight

By Matthieu de Tugny, IACS SG-QP Chair

As part of IACS' ongoing commitment to continuous improvement in quality, in 2018 the Association investigated whether moves towards a fully independent quality assessment review body would further strengthen maritime stakeholders' confidence in the IACS Quality System Certification Scheme (QSCS) and facilitate International Maritime Organization (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 a universal, 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, 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 in compliance with the requirements of the RO Code in relation to the relevant provisions of IMO mandatory instruments, e.g. SOLAS 1974, regulations I/6, II-1/3-1 and XI-1/1, as well as the III Code;

2. the performance of ACBs against the criteria of QSCS;

3. the nature of 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.

IQARB 4, which took place in London on 3-4 May 2022, saw the fulfilment of these objectives by the release of assessment results into the public domain, in the form of Factual Statements issued by IQARB to each IACS Member. These Factual Statements are intended for use by flag State Administrations who are encouraged to consider utilising them as a component to assist in demonstrating that they are fulfilling some of their obligations with respect to the relevant provisions of the IMO mandatory instruments, such as SOLAS 1974, regulation XI-1/1, as well as the III Code and the RO Code, with regard to the oversight programme exercised by flag State Administrations for their ROs.

The issuing of the IQARB Factual Statements followed a thorough review by IQARB members of:

1. the IACS Quality Secretary's Statements of Fact for each classification society; and

2. the results of the review of audit findings and analysis for each society prepared and presented by the IQARB Independent Quality Assessment Analyst (IQAA).

To assess the robustness of QSCS as a whole, IQAA presented a consolidated review of quality-related findings held on the IACS QSCS database for all classification societies. IQARB considered this system to be robust and, as a result of the discussions that arose, the IQAA will investigate whether any meaningful correlation can be made between numbers of audit findings and Port State Control records for individual classification societies and whether identifying how findings are closed out can help to prevent reoccurrence.

With this second tranche of Factual Statements, IQARB's trial phase has clearly delivered proof of concept. Therefore, IQARB 4 also began the work to further develop IQARB into a system which could expand beyond the assessment of the quality certification process of IACS Members. Expanding its remit to include ROs which are not Members of IACS and undertaking an assessment of the quality provisions that would be open to, and pertain to, all classification societies and ROs, would significantly increase IQARB's relevance to all stakeholders.

IQARB 4 saw changes to its flag State Administration membership, with Canada and the United Kingdom joining IQARB replacing New Zealand and the United States. The United States opted to take up one of the vacant positions representing Port State Control. Additionally, BIMCO was invited to join IQARB as a shipowner representative body.

Other developments relating to the further development of IQARB included an agreement to merge the Quality Assurance and Certification Entity (QACE), which certifies EU ROs in accordance with EC Regulation 391/2009, into IQARB. This significant step will allow for the provision of a single, legally constituted, body that contains the necessary skills, secretariat and financial management to allow IQARB to further develop while ensuring QACE objectives continue to be met.

Additionally, as IQARB continues to develop, it is recognised that promoting the work of this body to flag State Administrations is important in ensuring that there is a greater understanding of the potential benefits of IQARB and its outputs such as the IQARB Factual Statements. This is especially the case now that the IMO's Maritime Safety Committee has recognised the usefulness of the Factual Statements and agreed that the IMO guidance for flag State Administrations being developed should identify how services from IQARB can be legitimately and voluntarily used by flag State Administrations (while not absolving flag State Administrations of their oversight responsibilities) as part of their RO oversight and be formally recognised as such within the IMO Member State Audit Scheme (IMSAS).

Looking to the future, IQARB will focus on the immediate challenges of facilitating the engagement of all flag State Administrations in IQARB and expanding its oversight to include non-IACS classification societies and ROs. Both these tasks are being actively progressed by a small Steering Committee within IQARB while the newly formed IQARB Technical Committee is investigating how it should work with IACS and other interested parties with the objective of integrating various standards applicable to classification societies and ROs into a unified, recognised and accepted standard, noting that IACS will continue to own Quality Management System Requirements (QMSR). ■

Quality at every level

IACS' approach to quality results in competent, efficient and impartial services

By Łukasz Korzeniewicz, IACS Quality Committee Chairman

A crucial value of any organisation is quality. This is particularly true for IACS, with its goals of ensuring safety of life and property, and protection of the marine environment.

The key aspect of demonstrable quality is the maintenance of quality at every level and for every process, product, decision, survey, inspection, and task. Additionally, continuous development and improvements, constant quality assurance supported by monitoring or verification systems and compliance, and even exceeding internationally recognised standards are essential to demonstrate quality.

'Quality Performance' as described in IACS' Vision & Mission is the commitment of IACS Members to define and adhere to the highest global quality standards, through rigorous application of the IACS Quality System Certification Scheme (QSCS) and through actual performance proven by appropriate key performance indicators.

IACS' unique approach to, and implementation of, quality is supported by this mission and is vital to IACS' and its Members' contribution to maritime safety and environmental protection. This mission is achieved by:

- Providing assistance to international regulatory bodies and standards organisations in the development, implementation and interpretation of statutory regulations and industry standards in ship design, construction and maintenance with a view to improving safety at sea and prevention of marine pollution; and
- the establishment, review, promotion and development of minimum technical requirements in relation to the design, construction, maintenance and survey of ships and other marine related facilities.
- Regarding its vision, IACS has over the years strengthened its position as a trusted partner of regulators with respect to the development of maritime regulations and maintenance of classification as the primary mechanism for practical self-regulation of the maritime industry.

To establish and ensure consistent application of the QSCS, IACS invites Accredited Certification Bodies (ACBs) and auditors to perform independent audits of IACS Members. ACBs use highly qualified professional auditors with extremely good knowledge of quality standards, IACS, IACS Members, application of IACS Resolutions, IACS Members' Rules and international regulations.

IACS' rigorous implementation of, and member compliance with, the QSCS ensures the delivery of consistent and high-quality services from IACS Members.

Additionally, to ensure the effective and consistent implementation and application of international regulations, quality standards, IACS Resolutions and IACS Members' Rules, the QSCS requires IACS Members to undergo Vertical Contract Audits (VCA), in addition to the standard offices audits. VCA is a combination of a 'process audit' and a 'product audit'. The main purpose is to assess the effectiveness of the service delivery process in ensuring product quality. It identifies possible improvements in processes and sub-processes and their interactions with other associated processes and their interfaces, including management control.

The Quality Secretary is responsible for the robustness, consistency, effectiveness and integrity of the QSCS, with the support of other IACS QSCS Operations Centre personnel. Together, they strive to promote a uniformly high quality standard among IACS Members.

An external view of the quality management of IACS Members and the effectiveness of the QSCS is complemented by the Quality Advisory Committee (AVC), which provides an impartial opinion on the work and performance of IACS Members with respect to QSCS.

"Over the years, the robust and independently audited QSCS has proven to be a globally recognised maritime gold quality standard which even non-IACS classification societies aspire to comply with"

To enhance the effectiveness of the QSCS certification process, external observers may attend and observe QSCS audits. They are required to maintain strict confidentiality in respect of any information or data they become privy to during their observations. These observers are independent from IACS Members and represent governmental and non-governmental organisations in the maritime industry.

Over the years, the robust and independently audited QSCS has proven to be a globally recognised maritime gold quality standard which even non-IACS classification societies aspire to comply with.

Compliance with the QSCS provides confidence that IACS Members are not only competent, efficient and impartial, but it also assures that they have professional integrity and maintain high professional standards. ■

Shared cornerstones of inclusivity and partnerships

Trusted relationship with IMO goes from strength to strength

By Konstantin Petrov, IACS Accredited Representative to IMO

As the world emerges from the Covid-19 pandemic, the need to create a more resilient global society, better able to weather future storms, is clear. As such, it has been inspiring to observe the leading role of the International Maritime Organization (IMO), not only with its return to tried-and-tested ways of doing business, but also its pivot under unique circumstances to improve the efficiency and effectiveness of the Organization and to put in place a creative environment for all who work to advance the aims of the IMO.

IACS considers the IMO's approach of tackling the shipping world's complex challenges through inclusivity and partnerships as a keystone to success. IACS supports IMO's employment of soft diplomacy to create pathways to channel the very best advice and foster consensus on complex issues facing the world today.

IACS noted the emphasis placed by the IMO Secretary General in his address on World Maritime Day on inclusivity and partnerships as success factors in delivering the technological solutions needed for the decarbonisation of shipping. Echoing that sentiment and recognising the need for transformation, IACS has launched a long-term collaborative safe decarbonisation programme to ensure that new technological solutions are deployed safely on board ships. That collaborative programme envisages consultation and input from the main shipping industry stakeholders, including equipment makers, shipbuilders, shipowners, charterers, insurers and governments. Through this approach, IACS recognises the role of people and the impact of technological solutions on them and has incorporated consideration of the human element into its work. IACS will examine the impacts of alternative fuels and technologies on people both on board ships and onshore.

Contribution to the work of IMO remains one of the main pillars of IACS' work. That continuous programme feeds into the development of the international statutory safety regime at IMO. As examples, IACS submitted documents to the 32nd IMO Assembly, the Maritime Safety Committee (MSC) 105 and the Sub-Committee on Carriage of Cargoes and Containers (CCC) 8, raising the need to holistically address the challenges of safe decarbonisation. Those submissions articulated the multifaceted nature of the safe decarbonisation challenge, argue for overarching management of regulatory development activities by the MSC, and offer IACS' opinion on how that work could be organised. IACS was encouraged by the support from IMO Member States and Non-Governmental Organisations (NGOs) expressed at CCC 8 on the appropriateness of that approach. To take this forward, IACS is working with interested Member States and NGOs on a proposal for a new output to MSC 107.

Gathering knowledge from across its membership, and partnering and sharing with the wider shipping community strengthens IACS' aim of leaving no one behind. With that in mind, IACS participated in the IMO's Innovation Forum 28-29 September 2022 and underscored decarbonisation, and its safety, as the most pressing and complex task facing industry today, particularly the move from a single fuel type to multiple fuels/technology solutions to power shipping. IACS' Members are focused on technical, operational and skills challenges related to that challenge. During that Forum, IACS noted that private investment allows for the performance of pilot projects such as small hydrogen powered ships, while OEMs can offer large scale demonstrators. IACS' role is to gather the experience and knowledge to deliver a unified approach, looking not only at technical aspects, but also at operation and skills.

Dovetailing with the work on novel technologies and alternative fuels as a route to decarbonisation

"Contribution to the work of IMO remains one of the main pillars of IACS' work"

are measures to achieve efficiencies in operation through design and ship management to accelerate the peaking of CO_2 emissions and benefit from the effective use of high investment in solutions and fuels. Among those measures, reliance on the analysis of ship performance data is recognised as a valuable contributor. The digitalisation of the shipping industry to allow for that analysis is receiving more attention, together with the evolutionary application of other digital options to address the safety of shipping and to aid and/or supplement surveys.

IACS has contributed to the start of IMO's work on remote surveys, audits and verifications, based on its work on remote classification surveys. In parallel, IACS launched a project to review the risks and benefits of the deployment of complex technology and systems on board ships, with impact on SOLAS.

As the pace of new technology development and deployment continues to accelerate, ship designs and systems have become increasingly sophisticated to the point that there is already a significant degree of complexity in modern ships' systems. It is therefore difficult to distinguish between a simple and a complex ship as there is a range of complexity to consider. Current systems have a complexity that is addressed through repeatability and designer/verifier/user familiarity that can be translated into prescriptive rules. As the level of complexity increases, risk assessments are generally required in circumstances where full prescription is impractical or would be overly restrictive.

Further, differences from established norms, both in the multiple technologies deployed and in their integration on board ship and in the ship-shore interface, create rapidly escalating engineering and assurance challenges. As the complexity of ships' systems continues to evolve, this will necessitate an appropriate response from IMO and/or IACS, in respect of the actual technical requirements applicable to a ship's structure and systems and the process of assurance and certification. The work undertaken by the IACS Industry Joint Working Group aims to tackle that safety challenge.

The second IMO event in 2022 celebrated the inaugural International Women in Maritime Day. It gave IACS great pleasure to join IMO in celebration of that day. IACS is proud of the representation of women in leadership positions within its organisation.

IACS is committed to maintaining the necessary level of support to IMO both in terms of pace and scope. IACS values greatly its role as the principal technical advisor to the IMO and the advice, expertise and experience of IACS' 11 Members is always available both to the Organization and the wider maritime industry in pursuit of shared objectives of cleaner and safer shipping. ■

Cross-Industry Collaboration Key To Progressing Core Issues

IACS' programme of engagement with industry back to full speed

By Robert Ashdown, Secretary General

As the Covid-19 travel restrictions gradually improved in 2022 so too did the opportunities for organisations to meet to share their views and develop positions on the key topics affecting the maritime industry. The improved travel situation allowed IACS to resume its traditional cycle of meetings with industry at both the technical and policy levels which meant that a number of work items could be completed while new projects were identified and initiated.

While matters to do with decarbonisation rightly predominated, time was still found to make progress on diverse topics such as Ballast Water Management, Underwater Noise, Cyber Security, Fires on Container Ships and Losses of Containers at Sea among others. In the IACS/Industry Technical Meeting held in May 2022, it was also suggested that the Joint Industry Working Group (JIWG) on Marine Autonomous Surface Ships (MASS) should take forward the work emanating from MSC 105. Meanwhile, within IACS work is ongoing to identify the gaps between the current regulations and requirements of conventional ships and the newly developed regulations and requirements of MASS, particularly in addressing human element issues, including additional training needs of surveyors and other personnel. This is with a view to developing a new Unified Requirement (UR)/Recommendation to address any gaps identified.

On underwater noise, IACS is developing a new UR for measurement procedures to ensure reproducible measurement results for use by IACS classification societies within their existing or future class notations on underwater noise, an approach which will allow industry to more easily identify the class notations that suit their purposes.

Looking to the future, IACS was also pleased to have good industry input into its work on future proofing the maritime safety regime via a dedicated JIWG. This initiative looks to address the regulatory challenges associated with technology that may offer an alternative to traditional time-based survey and increasingly complex technology within ships' systems.

In essence, the rapid adoption of new technologies to meet multiple objectives leads to complex implementation challenges in a traditional maritime industry, which may result in an unsafe state on board ships in service. Considerations of safety, improved business performance and extended operational challenges, including improved environmental performance, can be further complicated by the passing of crew functions to technical systems on and off the ship.

Given the limited understanding of design principles for these systems, a lack of understanding of the ship as a system, the changing role of the human operator, and the multiplicity of approaches, it is recognised that there are integration and assurance challenges that are not obviously addressed by existing rules and regulations. While SOLAS offers generic alternative routes to qualify new technologies, the objective baseline to be achieved and the means of consistently demonstrating compliance may not be either clear or practically applicable. Regulations do not consider alternatives to time-based survey regimes and, as a result, the anticipated benefits are out of reach until the risks are properly understood and managed through the lifecycle. Without future proofing and proper application of regulations there is an increasing risk to the safety of shipping which this JIWG seeks to address.

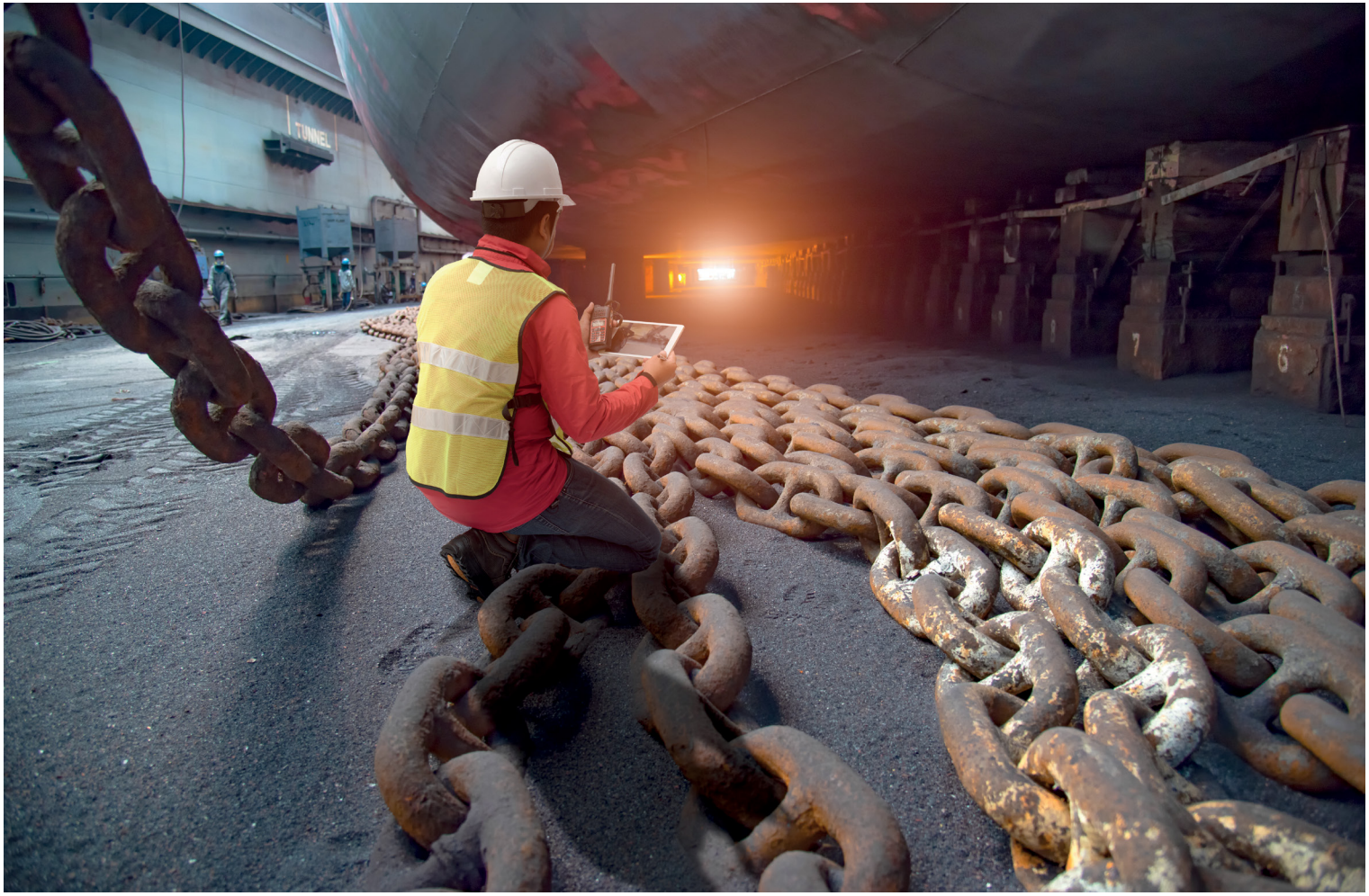
Recognising that work on decarbonisation needs to start from a position of knowledge, IACS is working with its industry partners to provide a comparative analysis of different energy sources looking at aspects such as storage requirements and engine configuration requirements and establishing the positives and benefits of each. Together with the identification of new fuels and technologies, including batteries, with their associated properties, hazards, and recommended control options, this will provide invaluable input to the JIWG that will be taking these aspects forward. Bringing other interested parties, such as fuel manufacturers, into this working group is especially important if a truly holistic overview is to be achieved.

IACS' deepening technical relationship with the International Union of Marine Insurance (IUMI) also resulted in further progress across a number of areas in 2022, for example on preventing fires from low-pressure fuel pipes, containership lashings (on which IACS has established a project team) and the initiation of joint initiatives on fires on container ships.

On cyber safety, meanwhile, and following the publication of IACS URs on Cyber resilience of ships and Cyber resilience of onboard systems and equipment, IUMI also welcomed the publication in 2022 of Recommendation 171 on incorporating cyber risk management into Safety Management Systems.

Going forward, cyber safety and security in the maritime sphere remains a principal concern for marine insurers and so the continuation of the very active JIWG on Cyber Safety, which met twice again in 2022 (for its 22nd and 23rd meetings), is welcome, as is the additional work being done by IACS Cyber System Panel on matters such as data quality and the evolution of UR E22 which specifies the requirements that apply to the design, construction, commissioning and maintenance of computer-based systems where they depend on software for the proper achievement of their functions.

A further Tripartite meeting – comprised of shipbuilders, class and shipowners - was held in December 2022 and covered its traditional themes of decarbonisation, environment and safety. Notwithstanding the familiarity of the themes, new areas of work emerged, including growing concerns with the carriage of electric vehicles, both as cargo and as passenger cars, with the charging of electric vehicles in the latter instance a particular focus.



The growing awareness of the environmental impact of grey water was also considered along with what measures could be put in place to alleviate these concerns, noting this remains one of the few remaining overboard discharges that is almost entirely unregulated. Changes to MARPOL Annex IV in terms of the revision of the Guidelines on implementation of effluent standards and performance tests for sewage treatment plants were also considered. The issue of non-compliance of the effluent of sewage treatment plants (STP) in operation was brought to the attention of IMO's MEPC Committee and concerns were also raised regarding the absence of performance verifications of STP during operation under MARPOL Annex IV.

At the end of the year, IACS was also delighted to welcome the industry to its 86th IACS Council session, held in-person in London. Again, the topics were broad and wide-ranging with productive discussions around the need for cross-industry collaboration on safe decarbonisation, the need for enhanced data-sharing around new technologies, progress with IQARB and a number of projects currently underway in IACS that will, in time, feed into the future evolution of Common Structural Rules.

These discussions also built upon a series of visits by the IACS Chair to our industry partner associations that, as always, provided an informal and confidential opportunity to understand the priorities and interests of the various sectors and to establish where IACS can provide support and input to the various work streams with which it is engaged. ■

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

Project teams in detail

Cyber System Panel – 4 Project teams

PT PC03	Requirements for cyber resilience
PT PC04	Translation of the Rec.166 into an UR
PT PC05	Incorporation of cyber risk into ISM
PT PC06	Ship data quality
PT PC07	Compliance with UR E26 and E27

Environmental Panel – 4 Project teams

PT PE03	EEXI reference speed validation
PT PE04	Implementation of IMO EEXI framework
PT PE05	Implementation of IMO SEEMP/CII
PT PE06	Implementation of the BWM Conv

Hull Panel – 10 Project teams

PT PH32	CSR Maintenance Team
PT PH38	Whipping on Containerships
PT PH40	Wave data investigations
PT PH43	Buckling requirements
PT PH44	Fatigue Assessment
PT PH46	Tank testing for small ships
PT PH47	Stress criteria for Type C tanks
PT PH48	Anchoring for small vessels
PT PH49	Wave loads
PT PH50	Structural Analysis and CA

Machinery Panel – 6 Project teams

PT PM26	IGF development
PT PM41	Shaft alignment investigations
PT PM43	Revision of UR M78
PT PM44	Internal combustion engine approval and inspection
PT PM46	Machinery Piping Systems
PT PM47	Earthing guidelines for ships and MODU

Safe Decarbonisation Panel – 4 Project teams

PT PD01	Ammonia as fuel
PT PD02	Hydrogen as fuel
PT PD03	Carbon capture & storage technologies
PT PD04	Use of novel batteries

Safety Panel – 4 Project teams

PT PS42	UR F44 to include chemical tankers
PT PS43	Underwater Noise
PT PS45	Develop text for SOLAS II-2/9
PT PS46	Amendments to the IGC Code

Survey Panel – 4 Project teams

PT PSU35	IGC Code Loading & Discharging
PT PSU36	Revision of UI GC 12
PT PSU38	Remote survey
PT PSU38	Revision of IMO Model course

EG-Formal Safety Assessment – 1 Project team

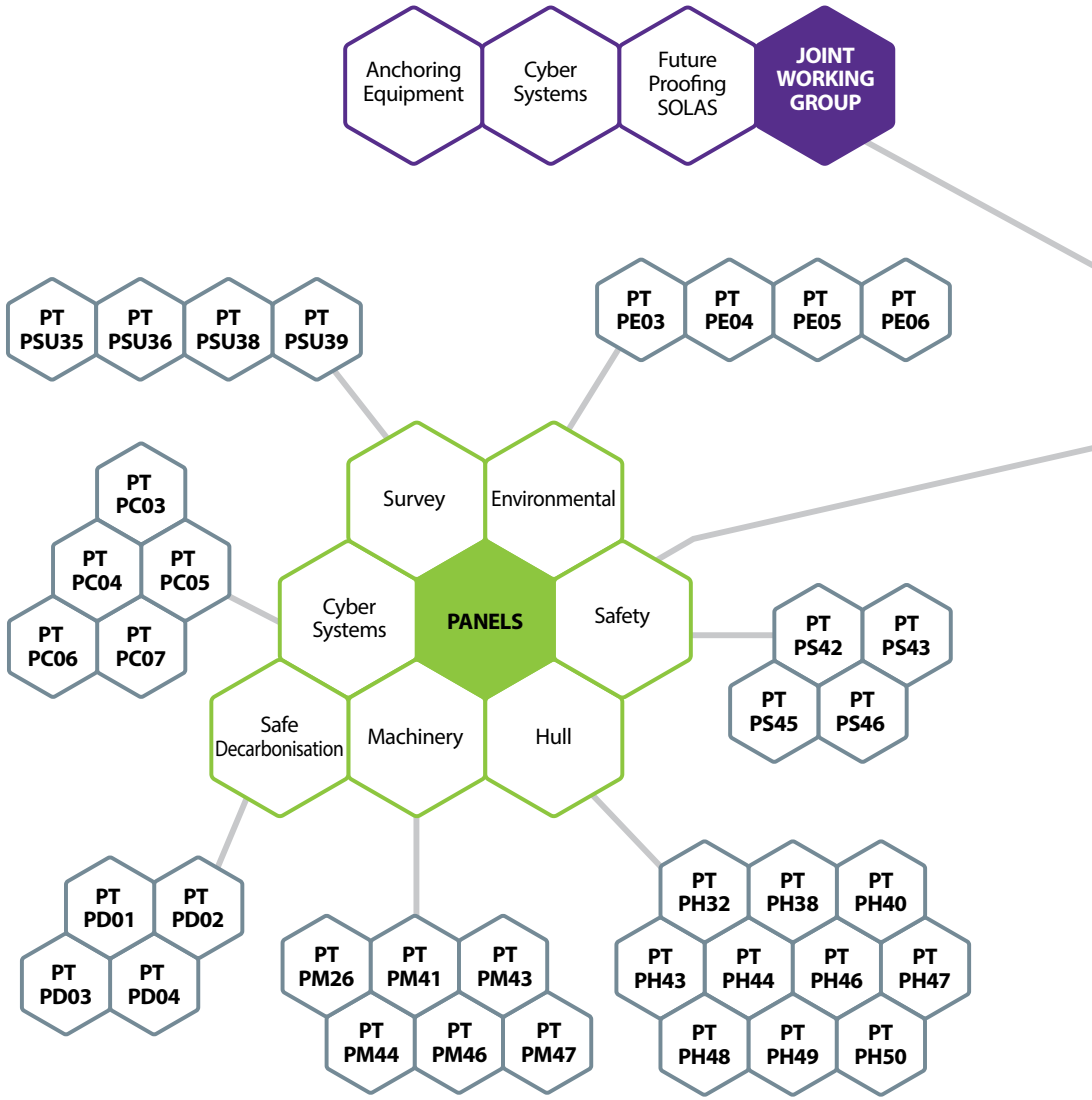
PT GISIS	Examination and Testing of new GISIS MCI module

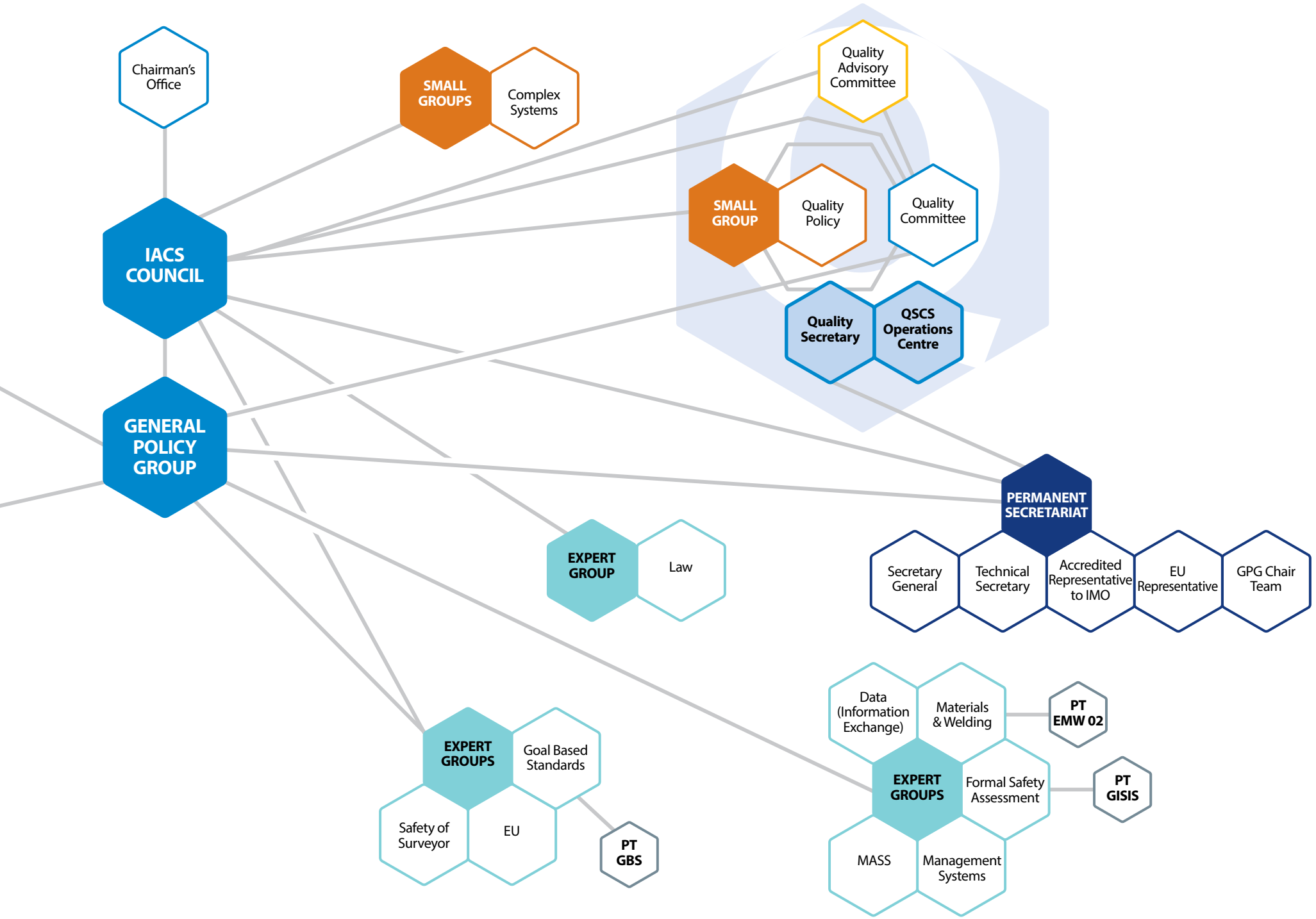
EG-Goal Based Standards – 1 Project team

PT GBS	GBS Maintenance

EG-M&W – 1 Project team

PT EMW02	Guidelines for Additive Manufacturing

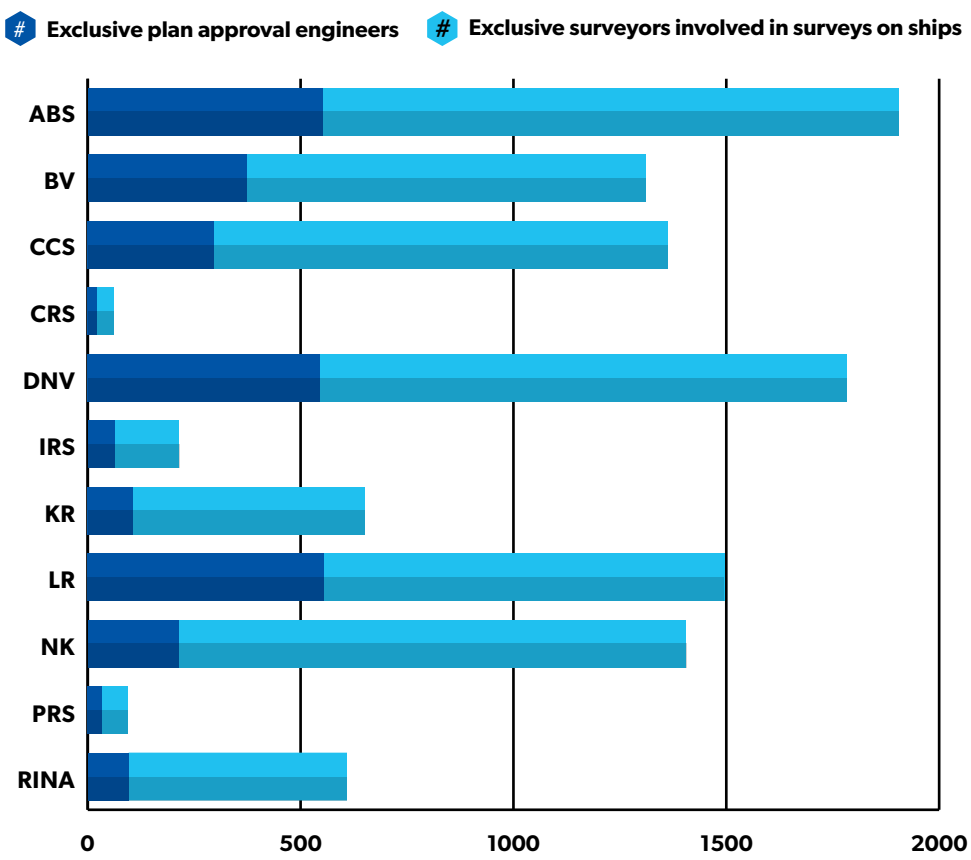



Chairman's Office
SMALL GROUPS
Complex Systems
Quality Advisory Committee
SMALL GROUP
Quality Policy
Quality Committee
Quality Secretary
QSCS Operations Centre
IACS COUNCIL
GENERAL POLICY GROUP
PERMANENT SECRETARIAT
Secretary General
Technical Secretary
Accredited Representative to IMO
EU Representative
GPG Chair Team
EXPERT GROUP
Law
EXPERT GROUPS
Goal Based Standards
Safety of Surveyor
EU
PT GBS
Data (Information Exchange)
Materials & Welding
PT EMW 02
EXPERT GROUPS
Formal Safety Assessment
PT GISIS
MASS
Management Systems

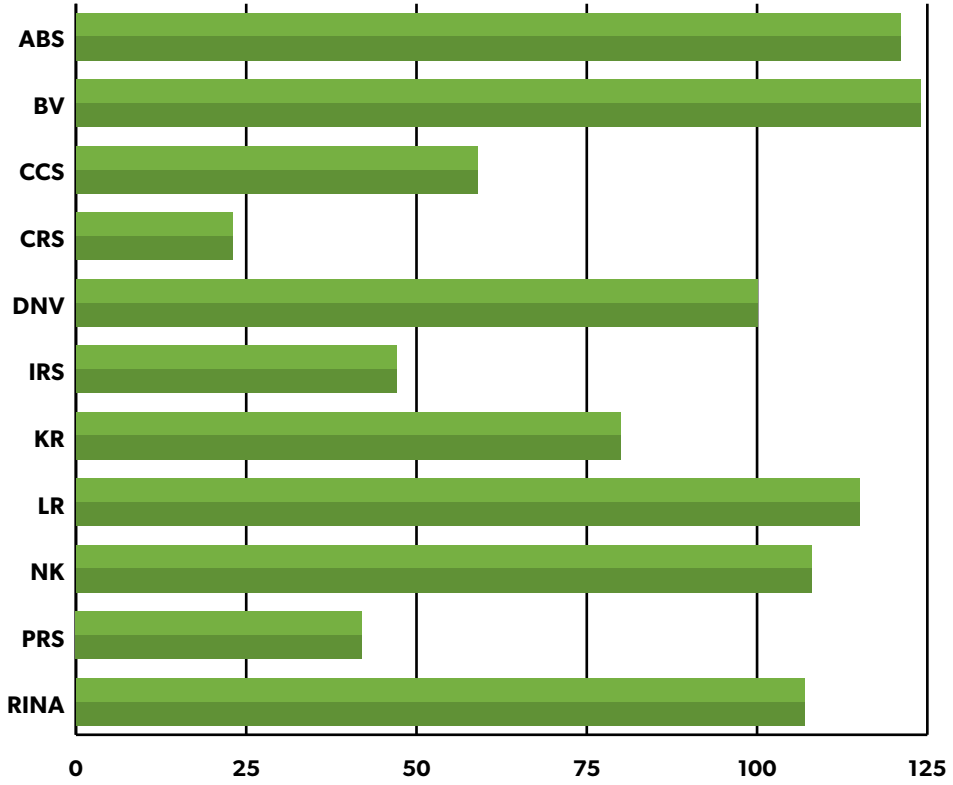
IACS Class Report Data 2022

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]

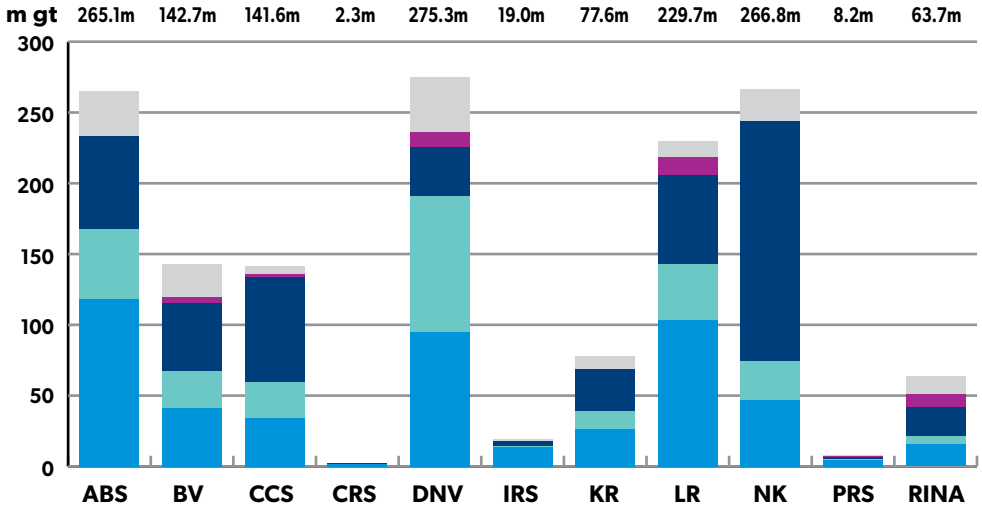


Number of recognising flag State authorities[2]



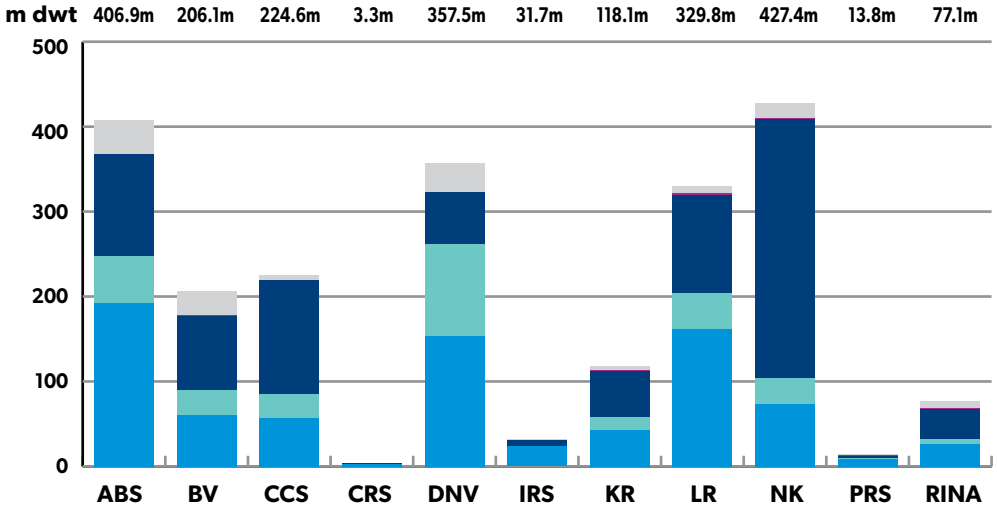
Total gross tonnage by type[3]

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



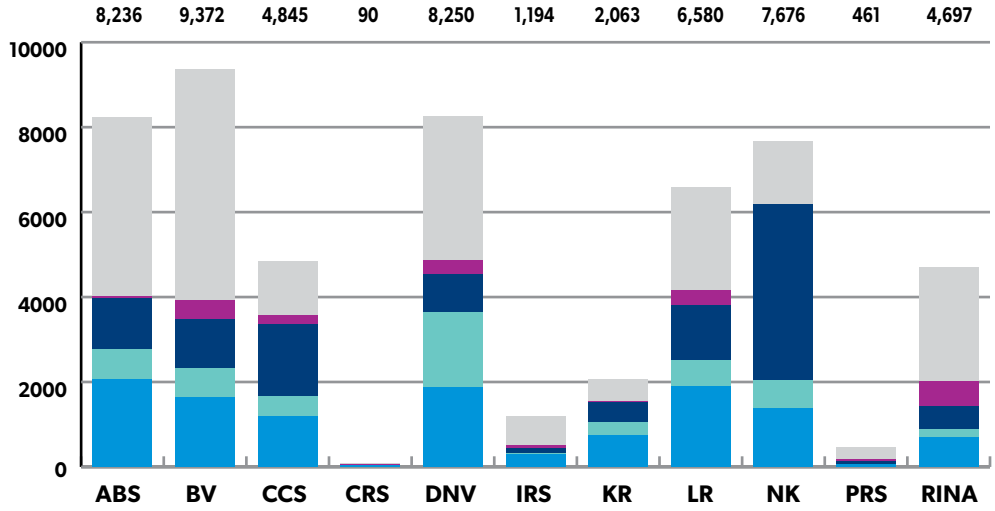
Total deadweight by type[3]

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

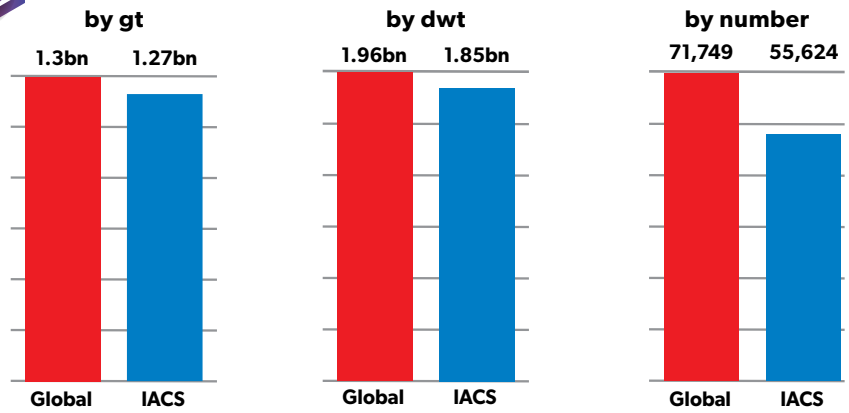


Total number of vessels by type[3]

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

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%.

IACS' contribution to the smooth and efficient functioning of the maritime industry

IACS Resolutions cover a range of class, regulatory and operational matters of relevance

The evolution and continuous review of IACS Resolutions and Recommendations is an essential part of IACS' work. Keeping this large body of material up to date is vital to maintain its ongoing relevance, while the production of new Resolutions in response to technical, regulatory or operational advances demonstrates IACS' technical leadership and responsiveness.

The selection below represents only a small sample of the work undertaken in 2022 and highlights IACS' activity across the maritime sphere. A list of all IACS Resolutions amended or developed in 2022 can be found in the *Appendix* which starts on page 52.

CYBER RESILIENCE

In 2022, recognising that cyber incidents on vessels can have a direct and detrimental impact on life, property, and the environment, IACS has steadily increased its focus on the reliability and functional effectiveness of onboard, safety-critical, computer-based systems. Utilising the experience gained from its existing Recommendations, as well as developments at IMO including, in particular, IMO Resolution MSC.428(98) applicable to in-service vessels since 1 January 2021, IACS has adopted two new Unified Requirements (URs) on the cyber resilience of ships.

UR E26 (New Mar 2022)
UR E26 aims to ensure the secure integration of both Operational Technology (OT) and Information Technology (IT) equipment into the vessel's network during the design, construction, commissioning, and operational life of the ship. This UR targets the ship as a collective entity for cyber resilience and covers five key aspects: equipment identification, protection, attack detection, response, and recovery.

UR E27 (New Mar 2022)
UR E27 aims to ensure system integrity is secured and hardened by third-party equipment suppliers. This UR provides requirements for cyber resilience of onboard systems and equipment and provides additional requirements relating to the interface between users and computer-based systems onboard, as well as product design and development requirements for new devices before their implementation on board ships.

These URs will be applied to new ships contracted for construction on and after 1 January 2024 although they may be applied in the interim as non-mandatory guidance.

WAVE DATA AND CSR IMPROVEMENTS

Accurate wave data remains of paramount importance as this data is used to represent the ocean environment, underpinning wave load prescription, which in turn, greatly impacts hull structural requirements. With more extreme weather being experienced in recent years, including the possible effects of climate change, accurate wave data is vital.

By taking into consideration publicly available AIS ship position data, wave data can be mapped to actual ship position and time, which can be used to prove that bad weather avoidance has a significant impact on the wave statistics of sea states encountered.

Rec 34 (New Dec 2022)
Rec 34 contains an updated scatter diagram, using validated datasets of wave data and ship positions to facilitate more accurate estimations of design loads, including pressures, motions, accelerations, and hull girder loads

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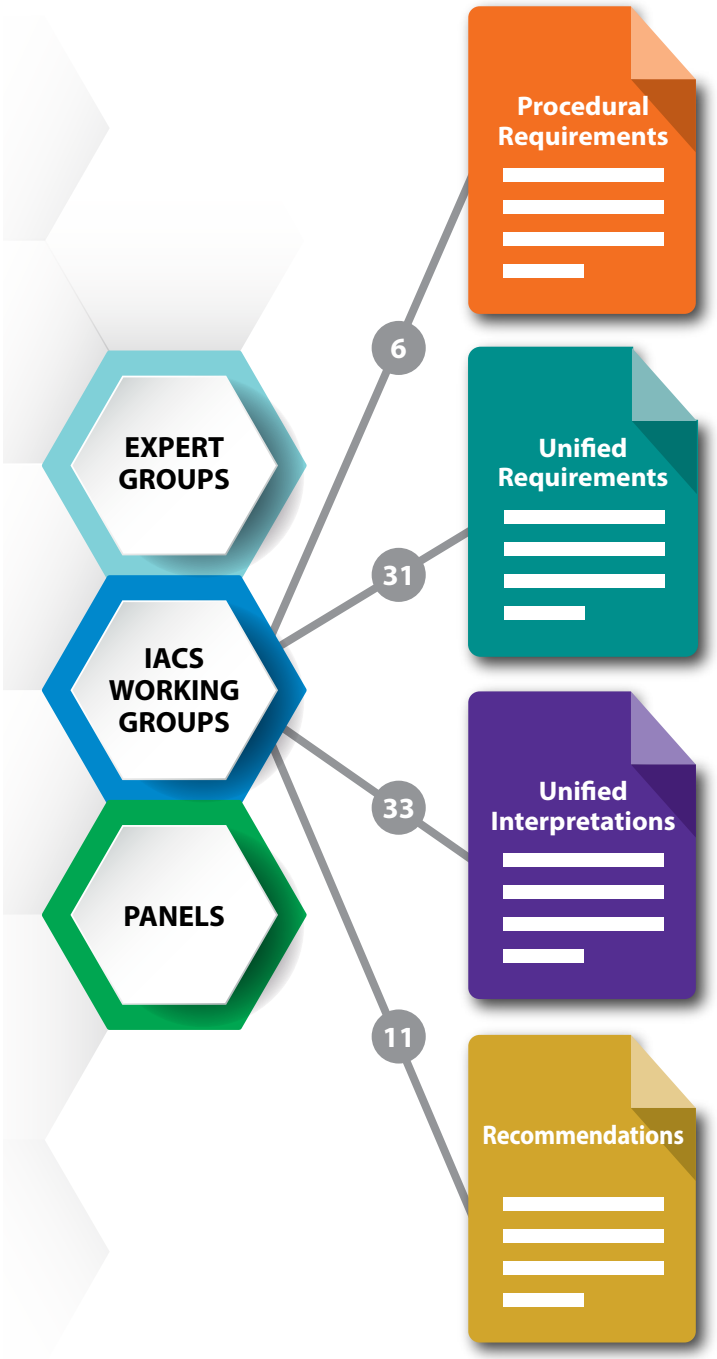

PR 41
Reporting on existence of asbestos on board

PR 1C
Procedure for Suspension and Reinstatement or Withdrawal of Class

PR 10
Procedure for the Selection, Training, Qualification and Authorisation of Marine Management Systems Auditors

UR Z29
Remote Classification Surveys

UR E26
Cyber resilience of ships

UR S14
Testing Procedures of Watertight Compartments

UI SC296
Noise level limit in workshops onboard ships

UI LL11
Scuppers, inlets and discharges

UI GC32
Outer Duct in Gas Fuel Piping Systems

Rec 34
Standard Wave Data

Rec 60
Intact stability of tankers during liquid transfer operations

Rec 172
EEXI Implementation Guidelines

– all of which contribute to the improved standardisation of safety levels of the fleet. This significant new data source will also be of value to other industry stakeholders who use wave data for individual projects.

RCN to CSR 1 Jan 2022
RCN to CSR 1 Jan 2022 has harmonised the ship length used in Common Structural Rules (rule length) with that used in Goal Based Standards (freeboard length), enhanced buckling strength requirements in CSR, defined the upper limit of intermittent weld leg length, and defined the corrosion application applied to the superstructure, as well as for the application of rules requirements and associated loads for various structural elements.

GLOBAL AND CONSISTENT IMPLEMENTATION OF EEXI

The mandatory nature of IMO's Energy Efficiency Existing Ship Index (EEXI) means it has a significant role to play in ensuring that the industry remains on track to meet greenhouse gas (GHG) reduction targets. IACS is fully supportive of IMO's initiatives on decarbonisation and has played an essential role in the development of EEXI by the IMO's Marine Environment Protection Committee (MEPC) through the provision of technical comments and proposals across ten submissions relating to ship energy efficiency and carbon intensity (EEDI/EEXI/CII), four of which focus on EEXI.

Rec 172 (June 2022)
IACS Recommendation No. 172 (Rec 172) has been developed to support the global and consistent implementation of the newly-developed EEXI IMO framework by providing additional advice and guidance on certain elements of the regulatory text where cross-industry discussions had identified technical implementation nuances associated with the EEXI framework.

Specific issues identified as needing further elaboration in Rec 172 include: the approval of the EEXI Technical File; non-overridable power limitation; EEXI calculation methodology for LNG Carriers; ship type applicability; appropriate Specific Fuel Consumption (SFC) values; and the uniform performing and validating of numerical calculations of the EEXI reference speed (Vref).

Rec 173 (June 2022)
Rec 173 contains a set of requirements for numerical calculations to be used for deriving the Vref in the framework of the EEXI Guidelines.

Rec 172 and Rec 173 are the latest expressions of IACS' ongoing commitment to supporting industry in meeting IMO's GHG reduction targets. IACS will continue to actively participate in the revision or upgrade of EEXI and the Carbon Intensity Index requirements. ■

Definitions

UR

Unified Requirements are adopted Resolutions on matters directly connected to or covered by specific Rule requirements and practices of classification societies, and the general philosophy on which the rules and practices of classification societies are established.

Subject to ratification by the governing body of each IACS Member, Unified Requirements should be seen as minimum requirements to be incorporated in the Rules and practices of Members within one year of approval by the IACS General Policy Group.

While each Member remains free to set more stringent requirements, the existence of a UR does not oblige a Member to issue respective Rules if it chooses not to have Rules for the type of ship or marine structure concerned.

CSR

The IACS Council adopted the **Common Structural Rules** for Double Hull Oil Tankers (CSR-OT) and Common Structural Rules for Bulk Carriers (CSR-BC) on December 14, 2005, for implementation on April 1, 2006, on the basis that these Rules were founded on sound technical grounds, and achieved the goal of more robust and safer ships.

These two sets of Rules were developed independently, and in order to remove variations and achieve consistency, IACS decided to harmonise these Rules to create a single set of Rules – '*Common Structural Rules for Bulk Carriers and Oil Tankers*' (CSR BC & OT). This comprised two parts: Part One gave requirements common to both bulk carriers and double hull oil tankers and Part Two provided additional specialised requirements specific to either bulk carriers or double hull oil tankers.

PR

Procedural Requirements are adopted Resolutions on matters of procedure to be incorporated in the practices and procedures of IACS Members within the periods agreed by the IACS General Policy Group.

UI

Unified Interpretations are adopted Resolutions on matters arising from implementing the requirements of IMO Conventions or Recommendations. The Resolutions can involve uniform interpretations of Convention Regulations or IMO Regulations on matters that are unclear.

Interpretations are circulated to the flag State Administrations concerned or sent to IMO for information. They are also designed to aid the development of regulations that are clear, unambiguous and can be easily applied by IACS Members to ships whose flag State Administrations have not issued definite instructions on the interpretation of the IMO regulations concerned, amid statutory certification on behalf of those flag Administrations.

Recommendations

IACS produces **Recommendations** and guidelines related to adopted Resolutions that not only deal with matters of class but also offer some advice to the marine industry.

IACS Members

IACS consists of 11 member societies, details of which are listed below.

ABS
American Bureau of Shipping
www.eagle.org

BV
Bureau Veritas
www.veristar.com

CCS
China Classification Society
www.ccs.org.cn/ccswzen/

CRS
Croatian Register of Shipping
www.crs.hr

DNV
www.dnv.com

IRS
Indian Register of Shipping
www.irclass.org

KR
Korean Register
www.krs.co.kr

LR
Lloyd's Register
www.lr.org

NK
Nippon Kaiji Kyokai
www.classnk.or.jp

PRS
Polish Register of Shipping
www.prs.pl

RINA
RINA Services S.p.A.
www.rina.org

Appendix I

Summaries of IACS Resolutions published in 2022

Summary of New/Revisions to IACS Unified Requirements published in 2022

New Revised Corrigenda Deleted/Withdrawn

Index	Resolution no.	Revision	Adoption	Title	Implemention Date
1	CSR 2021	Corr.1	Jan 2022	Corrigenda 1 to CSR 01 Jan 2021 Version	01 Jul 21
2	UR E10	Rev.8 Corr.1	Jan 2022	Test specification for type approval	-
3	UR E25	Rev.2	Feb 2022	Failure detection and response of all types of steering gear control systems	01 Jul 23
4	UR M42	Rev.6	Feb 2022	Steering gear	01 Jul 23
5	UR M61	Rev.1	Feb 2022	Starting arrangements of internal combustion engines	01 Jan 23
6	UR F15	Rev.6 Corr.1	Feb 2022	Reinforced thickness of ballast and cargo oil piping	-
7	UR W7	Rev.4	Feb 2022	Hull and machinery steel forgings	01 Jul 23
8	UR L4	Rev.3 Corr.2	Feb 2022	IACS documents reaching their 10th anniversary UR L4, UILL77 and UI CC6 (PS21015b)	-
9	UR M44	Rev.10 Corr.1	Feb 2022	Documents for the approval of diesel engines	-
10	UR M27	Del	Mar 2022	Bilge level alarms for unattended machinery spaces	-
11	UR M69	Del	Mar 2022	Qualitative failure analysis for propulsion and steering on passenger ships	-
12	UR E26	New	Mar 2022	Cyber resilience of ships	01 Jan 24
13	UR E27	New	Mar 2022	Cyber resilience of onboard systems and equipment	01 Jan 24
14	UR M73	Rev.1	Mar 2022	Turbochargers	01 Jan 23
15	UR Z29	New	Mar 2022	Remote classification surveys	01 Jan 23

Index	Resolution no.	Revision	Adoption	Title	Implemention Date
16	UR W8	Rev.3	Mar 2022	Hull and machinery steel castings	01 Jul 23
17	UR Z10.3	Rev.20	May 2022	Hull surveys of chemical tanker	01 Jan 23
18	UR Z10.4	Rev.17	May 2022	Hull surveys of double hull oil tankers	01 Jan 23
19	UR E13	Rev.3 Corr.1	May 2022	Test requirements for rotating machines	-
20	UR Z16	Rev.4 Corr.1	May 2022	Periodical surveys of cargo installations on ships carrying liquefied gases in bulk	-
21	UR Z7	Rev.29	May 2022	Hull classification surveys	01 Jul 23
22	UR P4	Rev.7	Jun 2022	Production and application of plastic piping systems on ships	01 Jul 23
23	UR E21	Rev.1 Corr.1	Jun 2022	Requirements for uninterruptible power system (UPS) units as alternative and/or transitional power	-
24	UR Z17	Rev.17	Jul 2022	Procedural requirements for service suppliers	01 Jul 23
25	UR Z1	Rev.9	Jul 2022	Annual and intermediate classification survey coverage of IMO Resolution A.1156(32)	-
26	UR Z23	Rev.7 Corr.1	Oct 2022	Hull survey for new construction	-
27	UR M45	Del	Nov 2022	Ventilation of machinery spaces	-
28	UR D11	Rev.4 Corr.1	Dec 2022	Safety features	-
29	CSR	2022 RCN1	Dec 2022	IACS CSR for bulk carriers and oil tankers	01 Jul 23
30	UR G5	New	Dec 2022	Fail-close action of Emergency Shut Down (ESD) Valve	01 Jan 24
31	UR S14	Rev.7	Dec 2022	Testing procedures of watertight compartments	01 Jan 24

Appendix I Summaries of IACS Resolutions published in 2022

Summary of New/Revisions to IACS Unified Requirements published in 2022

1. CSR 2021 (Corr.1 Jan 2022)

The consolidated version of CSR 2021 was issued in March 2021 and came into force on 1 July 2021. Rule Change Notice 1 (RCN1), Urgent Rule Change Notice 1 (URCN) and Corrigenda 1 to CSR 2021 version were published as outcomes of regular CSR maintenance.

2. UR E10 (Rev.8 Corr.1 Jan 2022)

UR E10 provides test specification for electrical, electronic and programmable equipment intended for control, monitoring, alarm and protection systems for use in ships. In this corrigendum, the uniform application statement has been corrected.

3. UR E25 (Rev.2 Feb 2022)

This UR applies to steering gear control systems as defined in UR M42 Appendix 1 Item 1. This revision includes the deletion of “hydraulic locking” from the failure list in paragraph E25.2.1 and amendment to clarify that the system response is not mandatory for mechanical failures.

4. UR M42 (Rev.6 Feb 2022)

UR M42 applies to steering gear and this revision is to clarify the definition of hydraulic locking.

5. UR M61 (Rev.1 Feb 2022)

UR M61 provides starting arrangements of internal combustion engines and the requirements mentioning the engine conditions (such as cold conditions and warm running condition) have been deleted in this revision.

6. UR F15 (Rev.6 Corr.1 Feb 2022)

UR F15 provides the requirements of reinforced thickness to ballast piping passing though cargo tanks and to cargo oil pipes passing though segregated ballast tanks. In this revision, editorial errors have been corrected.

7. UR W7 (Rev.4 Feb 2022)

These requirements are applicable to steel forgings intended for hull and machinery applications. They have been fully reworked and revised with updated industry standards and other IACS publications. Moreover, in the case of hollow ring forgings, clarification of the requirement regarding the position of test specimen has been introduced.

8. UR L4 (Rev.3 Corr.2 Feb 2022)

UR L4 is the requirement for the closure of chain lockers. Corr.2 updates the standards which are referenced in the UR.

9. UR M44 (Rev.10 Corr.1 Feb 2022)

UR M44 concerns the document for the approval of diesel engines, those being the documentation lists for approval and the document flow for engine certificates, as well as certification process. In this corrigendum “The FEMA reports required will not be explicitly approved by the Classification Society” in Foot note 5 of Table 1 was deleted.

10. UR M27 (Del. Mar 2022)

Due to duplication with SOLAS Reg. II-1/48, UR M27 has been deleted.

11. UR M69 (Del. Mar 2022)

UR M69 has been deleted as the way to refer to instruments other than those specified by IACS has been unified.

12. UR E26 (New Mar 2022)

UR E26 regarding cyber resilience of ships is newly established. This UR targets the ship as a collective entity for cyber resilience and covers five key aspects: equipment identification, protection, attack detection, response, and recovery.

13. UR E27 (New Mar 2022)

UR E27 regarding cyber resilience of onboard systems and equipment is newly developed. This UR provides requirements for cyber resilience of onboard systems and equipment and provides additional requirements relating to the interface between users and computer-based systems onboard, as well as product design and development requirements for new devices before their implementation on board ships.

14. UR M73 (Rev.1 Mar 2022)

This requirement is applicable to turbochargers with regard to design approval, type testing and certification and matching to engines. In this revision, clarification is provided for “date of application for clarification”.

15. UR Z29 (New Mar 2022)

UR Z29 has been newly developed to introduce principles and minimum requirements for carrying out remote surveys. To ensure all IACS Members have uniform guidance and requirements on remote surveys, a new IACS UR has been developed with the objective of allowing remote surveys only if the quality of survey is not compromised, and the survey is carried out with the same assurance as those performed by an on board attending surveyor.

16. UR W8 (Rev.3 Mar 2022)

UR W8 regarding hull and machinery steel castings has been fully reworked and revised, updating standards reference, detailing new requirements regarding test block dimension and positions, and updating requirements for welding, repair and NDT.

17. UR Z10.3 (Rev.20 May 2022)

UR Z10.3 provides the procedure for hull survey of chemical tankers. This revision amends the Minimum requirements of Thickness Measurements at Special Survey No.1 in line with the amendments made to ESP Code vide Res. MSC. 483(103).

18. UR Z10.4 (Rev.17 May 2022)

UR Z10.3 provides the procedure for hull survey of double hull oil tankers. This revision amends the Minimum requirements of Thickness Measurements at Special Survey No.1 in line with the amendments made to ESP Code vide Res. MSC. 483(103).

19. UR E13 (Rev.3 Corr.1 May 2022)

This UR provides the test requirement for rotating machines. In this Corr.1, the second sentence of Paragraph 4.5 has been corrected.

20. UR Z16 (Rev.4 Corr.1 May 2022)

UR Z16 is the requirement of periodical surveys related to cargo installation on ships carrying liquefied gases in bulk. This corrigendum is to correct an incorrect reference.

21. UR Z7 (Rev.29 May 2022)

UR Z7 provides the procedures of hull classification surveys. This revision is to clarify the requirements for thickness measurements for ships without cargo space because the thickness of measurement requirements within the amidships 0.5L stipulated only cargo space in table 1.

22. UR P4 (Rev.7 Jun 2022)

This UR addresses the production and application of plastic piping systems on ships. In this revision, clear specification of the specimen size and number to be used in fire endurance testing on flange connections in plastic piping systems is included.

23. UR E21 (Rev.1 Corr.1 Jun 2022)

UR E21 is the requirement for uninterruptible power system (UPS) units for alternative and/or transitional power. In this version, the references to IMO instruments have been modified (reworded appropriately), in accordance with IACS Procedures Volume 1.

24. UR Z17 (Rev.17 Jul 2022)

These are procedural requirements for classification societies to approve firms providing services, such as measurements, tests or maintenance of safety system and equipment. The main reason for this revision is to clarify verification requirements for practical demonstration at initial and renewal audits.

25. UR Z1 (Rev.9 Jul 2022)

UR Z1 provides the procedure of annual and intermediate classification survey coverage of IMO Resolution A.1156(32). This revision is to update survey items following the publication of IMO Res. A.1156(32).

26. UR Z23 (Rev.7 Corr.1 Oct 2022)

UR Z23 gives the procedural requirements of hull survey for new construction. The scope of this UR includes examination of the ship covered by classification rules and by applicable statutory regulations for hull construction as well as appraisal of the manufacturing, construction, control and qualification procedures, including welding consumable, weld procedures, weld connections and assemblies. In this revision, the reference in appendix 1 has been updated due to the replacement of ISO18001(OHSAS18001) by ISO45001.

27. UR M45 (Del. Nov 2022)

As UR M45 of ventilation of machinery spaces contains no additional requirements to existing statutory requirements (SOLAS and ICLL) it has been deleted.

28. UR D11 (Rev.4 Corr.1 Dec 2022)

UR D11 provides guidance for safety features, including fire protection and extinction, fire-fighting water supply, fire extinguishing system, fire-fighting equipment for helicopter facilities, fire detection and alarm system. This UR is updated to clarify “near other openings of accommodation spaces”.

29. CSR 2022 (RCN1 Dec 2022)

The consolidated version of CSR 2022 was issued in March 2022 and came into force on 1 July 2022. Rule Change Notice 1 (RCN1), Urgent Rule Change Notice 1 (URCN1) and Corrigenda 1 to CSR 2022 version were published as outcomes of regular CSR maintenance.

30. UR G5 (New Dec 2022)

UR G5 regarding fail-close action of emergency shut down (ESD) valves has been newly established in association with the requirement in 18.10.2.1.2 of the IGC Code for ESD valves of the fail-close type.

31. UR S14 (Rev.7 Dec 2022)

UR S14 provides testing procedures for watertight compartments to be carried out in accordance with Annex 1. The procedures for the test are divided into three parts: SOLAS ships for Part A, SOLAS exempt/equivalent ships for Part B, and Non-SOLAS ships for Part C. In this revision, changes were made to clarify the application of UR S14, especially for smaller ships/non-SOLAS ships. For that purpose, Part B was modified, and a new Part C was added. A test pressure head for ships under Part C is newly developed.

Summary of New/Revisions to IACS Procedural Requirements published in 2022

New Revised Corrigenda Deleted/Withdrawn

Index	Resolution no.	Revision	Adoption	Title	Implemention Date
1	PR 41	New	May-22	Reporting on existence of asbestos on board	01-Jan-23
2	PR 1C	Add Rev.5	Mar 2022	Procedure for suspension and reinstatement or withdrawal of class in case of surveys, conditions of class or recommendations going overdue	01 Apr 22
3	PR 10	Add Rev.3	Jun 2022	Procedure for the selection, training, qualification and authorisation of marine management systems auditors	01 Jul 22
4	PR 10B	Add Rev.3	Jun 2022	Procedure for the selection, training, qualification and authorisation of maritime labour inspectors	01 Jul 22
5	PR 1C	Add Rev.6	Jun 2022	Procedure for suspension and reinstatement or withdrawal of class in case of surveys, conditions of class or recommendations going overdue	01 Jul 22
6	PR 1C	Add Rev.7	Dec 2022	Procedure for suspension and reinstatement or withdrawal of class in case of surveys, conditions of class or recommendations going overdue	01 Jan 23

1 PR 41 (New May 2022)

This Procedural Requirement was introduced to ensure that the Organisation responsible for the issue of the Passenger Ship Safety Certification (PSSC), Cargo Ship Safety Construction (SAFCON) Certification or Cargo Ship Safety Certification (CSSC) of the ship and the flag Administration, as appropriate, are notified when the existence of asbestos on board is identified by another Class Society who carries out a survey or audit onboard, for example IHM, ISM or MLC.

2-6 Addendums to PR 1C, PR 10 & PR 10B

IACS has been regularly reviewing PRs as one of the measures supporting the IMO's call to help ships safely remain in service in the context of the COVID-19 pandemic. By end of 2022, all addenda have been removed except for PR 1C which will remain in force until 30 June 2023.

Summary of New/Revisions to IACS Unified Interpretations published in 2022

New Revised Corrigenda Deleted/Withdrawn

Index	Resolution no.	Revision	Adoption	Title	Implemention Date
1	UI MPC20	Rev.1 Corr.2	Feb 2022	Annex VI of MARPOL 73/78 Regulation 13.2.1.1 and 13.2.2	-
2	UI LL59	Rev.1 Corr.1	Feb 2022	Cargo manifold gutter bars - freeing arrangements and intact stability	-
3	UI SC123	Rev.3 Corr.1	Feb 2022	Machinery installations - service tank arrangements	-
4	UI GC32	Rev.1	Feb 2022	Outer duct in gas fuel piping systems	01 Jan 23
5	UI GC38	New	Mar 2022	Deck areas above F.O. tanks installed at the after end of the aftermost hold space	01 Jul 22
6	UI SC261	Rev.1	Apr 2022	Interpretation of performance standards for voyage data recorders (VDRs)	01 Jul 22
7	UI SC296	New	May 2022	Noise level limit in workshops onboard ships	01 Jan 23
8	UI SC200	New Corr.1	May 2022	Container storage arrangement for equivalent fixed gas fire extinguishing systems (FSS Code,Ch.5,2.4)	-
9	UI SC201	Rev.1 Corr.1	May 2022	Location of paint lockers within cargo block	-
10	UI SC204	New Corr.1	May 2022	Storage of fire-extinguishing media forward the cargo holds	-
11	UI LL81	New	May 2022	SDC 8 submission of new UI for Regulation 37 (3) of ICLL1966, as amended (PS18030c)	01 Jan 23
12	UI SC161	Rev.3	May 2022	Timber deck cargo in the context of damage stability requirements	01 Jan 23
13	UI LL80	Rev.1	Jun 2022	Unprotected openings	01 Jul 23
14	UI SC280	Rev.1	Jun 2022	Angle of down-flooding (ϕf)/Angle at which an opening incapable of being closed weathertight (ϕv)	01 Jul 23
15	UI SC218	Rev.1	Jul 2022	Fire testing of equivalent water-based fire extinguishing systems	01 Jul 23
16	UI SC219	Rev.1	Jul 2022	Fire testing of equivalent water-based fire extinguishing systems	01 Jul 23
17	UI LL11	Rev.4	Jul 2022	Scuppers, inlets and discharges	-
18	UI SC297	New	Aug 2022	Amendment to stability/loading information in conjunction with the alterations of lightweight	01 Jan 23
19	UI SC155	Del	Aug 2022	Lightweight check in lieu of inclining test	-

Appendix I Summaries of IACS Resolutions published in 2022

Summary of New/Revisions to IACS Unified Interpretations published in 2022

Index	Resolution no.	Revision	Adoption	Title	Implemention Date
20	UI SC254	Del	Aug 2022	Fall preventer devices (MSC.1/Circ.1392 and Circ.1327)	-
21	UI CC6	Rev.1	Aug 2022	Lining approved for use with acids – IBC Code item 15.11.2	01 Jan 23
22	UI SC217	New Corr.2	Aug 2022	Nozzles installation for fixed water based local application fire-fighting systems for use in category A machinery spaces (MSC/Circ.913)	-
23	UI FTP5	New Corr.1	Sep 2022	Testing and approval of "A" class divisions – fastening of insulation material and details of joints	-
24	UI SC198	New Corr.1	Sep 2022	Sections in local application fire extinguishing systems	-
25	UI HSC8	New Corr.1	Sep 2022	Protection of load bearing structures	-
26	UI FTP2	Del	Oct 2022	Pipe and duct penetrations	-
27	UI SC250	New Corr.2	Nov 2022	Fire-extinguishing arrangements in cargo spaces (IMSBC Code, as amended)	-
28	UI SC32	Del	Nov 2022	Fixed high expansion foam fire-extinguishing system	-
29	UI SC60	Del	Nov 2022	Fixed deck foam systems	-
30	UI LL61	Del	Nov 2022	Method of correction for the effect of free surface of liquids in tanks	-
31	UI FTP4	Rev.2	Nov 2022	Fire resistant windows on tankers	01 Jul 23
32	UI SC298	New	Dec 2022	Interpretations of various performance standards related to GMDSS radio installations	01 Jan 24
33	UI MPC14	Rev.3	Dec 2022	Annex VI of MARPOL 73/78	01 Jan 23

1. UI MPC20 (Rev.1 Corr.2 Feb 2022)

UI MPC20 provides a unified interpretation of MARPOL 73/78 Reg. 13.2.1.1 and 13.2.2. This revision is updated to reflect the amended text of regulation 13.2.2 of MARPOL VI adopted by Resolution MEPC.251(66).

2. UI LL59 (Rev.1 Corr.1 Feb 2022)

UI LL59 provides a unified interpretation of Regulation 26 of ICLL 1966 and Regulation 24 of ICLL 1988. As part of the 10th anniversary review, amendments were made to reorder the text of paragraph 3 for clarity.

3. UI SC123 (Rev.3 Corr.1 Feb 2022)

UI SC123 provides interpretation of SOLAS Regulation II-1/26.11. In Corr.1 of this UI, correction of an editorial error has been made to the second tank as per Example 1.2 (equivalent arrangement).

4. UI GC32 (Rev.1 Feb 2022)

UI GC32 provides a unified interpretation of paragraphs 5.4.4 and 5.13.2.4 of the IGC Code regarding the outer duct in gas fuel piping systems. In Rev.1 of this UI, the expression “duct” in paragraphs 5.4.4 and 5.13.2.4 of the IGC Code and the requirement to be applied to gas valve unit rooms have been clarified.

5. UI GC38 (New Mar 2022)

This UI provides a unified interpretation of the application of design temperature for piping, fittings and related components within the cargo area in paragraph 11.3.6 of the IGC Code in line with MSC.1/Circ. 1617.

6. UI SC261 (Rev.1 Apr 2022)

UI SC261 contains a unified interpretation of performance standards for voyage data recorders (VDRs). This UI was revised due to adoption of MSC.494(104) amending MSC.333(90).

7. UI SC296 (New May 2022)

UI SC296 provides interpretation of paragraph 4.2.1 of Res. MSC.337(91), Code on Noise Levels Onboard Ships, to clarify the noise level limit which is to be applied in workshops not forming part of the engine room.

8. UI SC200 (New Corr.1 May 2022)

UI SC200 provides interpretation of paragraph 2.4 of Chapter 5 of the IMO International Code for Fire Safety Systems as amended by resolution MSC.339(91). Revision 1 is updated for FSS Code editorial changes due to amendments.

9. UI SC201 (Rev.1 Corr.1 May 2022)

This UI regarding location of paint lockers within cargo block provides interpretation of SOLAS Ch. II-2 Regulation 4.5.1.2 and 4.5.1.3 and IBC Code Regulation 3.2.1 as amended by Resolution MSC.176(79). This revision is to update the UI following FSS Code amendments.

10. UI SC204 (New Corr.1 May 2022)

UI SC204 regarding storage of fire-extinguishing media forward the cargo hold provides interpretation of SOLAS Chapter II-2 regulation 10.4.3 and paragraph 2.1.3.3, Chapter 5 of the IMO International Code for Fire Safety Systems (FSS Code), as amended by resolution MSC.206(81). This revision is to update the UI following FSS Code amendments.

11. UI LL81 (New May 2022)

UI LL81 provides Interpretation of Regulation 37(3) of the International Convention on Load Lines 1966, as amended by the Protocol of 1988.

12. UI SC161 (Rev.3 May 2022)

UI SC161 provides interpretation of SOLAS Regulation II-1/5-1 regarding timber deck cargo in the context of damage stability requirements. Revision 3 has been updated following reconsideration the new TDC code (Resolution A.1048(27)) and SOLAS amendments (Resolution MSC.421(98)).

13. UI LL80 (Rev.1 Jun 2022)

UI LL80 provides interpretation of ICLL Regulation 27(13) regarding unprotected openings. This revision is updated to align with MSC.1/Circ.1535/Rev.1.

14. UI SC280 (Rev.1 Jun 2022)

UI SC280 provides interpretation for the 2008 IS Code, International Grain Code and SOLAS II-1 Regulation 7-2 regarding the angle of down-flooding, the angle at which an opening is incapable of being closed weathertight. This revision is updated to align with MSC.1/Circ.1537 and 1539.

15. UI SC218 (Rev.1 Jul 2022)

UI SC218 regarding fire testing of equivalent water-based fire extinguishing systems provides interpretation of IMO MSC/Circ.1165, Appendix B, 4.5.1. This revision reflects the amendments made to MSC/Circ.1165 vide MSC.1/Circ.1237 and MSC.1/Circ.1269.

16. UI SC219 (Rev.1 Jul 2022)

UI SC219 regarding fire testing of equivalent water-based fire extinguishing systems provides interpretation of IMO MSC/Circ.1165, Appendix B, 4.5.1. This revision reflects the amendments made to MSC/Circ.1165 vide MSC.1/Circ.1237 and MSC.1/Circ.1269.

17. UI LL11 (Rev.4 Jul 2022)

UI LL1 provides interpretation of Regulation 22(1) of the ICLL 1966 and of Regulation 22(1)(a) of the 1988 Protocol to ICLL 1966 as amended by resolution MSC.143(77) regarding scupper, inlets and discharges. Revision 4 updates the footnote to clarify sections of the UI applicable for 1966 protocol and sections applicable for 1988 protocol.

18. UI SC297 (New Aug 2022)

UI SC297 provides interpretation of SOLAS chapter II-1, regulations 5.4 and 5.5 (as amended by resolution MSC.421(98)) and of resolution MSC.429(98)/Rev.1 and Rev.2, Explanatory Notes about amendments to stability/loading information in conjunction with the alterations of lightweight. The new UI clarifies which documents need to be updated following a change in the lightweight particulars.

19. UI SC155 (Del. Aug 2022)

UI SC155 is deleted as its requirements have been replaced by UI SC297.

20. UI SC254 (Del. Aug 2022)

UI SC254 was created to provide clear prescriptive requirements for fall preventer devices which were permitted as a temporary measure until changes to SOLAS could be applied. As all lifeboats should have now complied, the UI can be deleted.

21. UI CC6 (Rev.1 Aug 2022)

UI CC6 provides interpretation of paragraph 15.11 Acids of IBC Code regarding the lining approved for use with acids. A new paragraph to clarify the elasticity requirements of a liner fitted in accordance with the IBC Code has been introduced.

22. UI SC217 (New Corr.2 Aug 2022)

UI SC217 provides interpretation of nozzle installation for fixed water-based local application fire-fighting systems for use in category A machinery spaces (MSC/Circ.913). This Corrigenda 2 to IACS UI SC 217 clarifies that while MSC.1/Circ.1387 generally supersedes MSC/Circ.913, the latter remains valid for the approval of new fixed water-based local application fire-fighting systems previously tested in accordance with MSC/Circ.913.

23. UI FTP5 (New Corr.1 Sep 2022)

UI FTP5 pertains to the testing and approval of "A" class division fastening of insulation material and details of joints in interpretation of paragraphs 1.6 and 7.5.1 of IMO Resolution A.754(18) and paragraphs 1.12 and 7.6.1 of 2010 FTP Code, Annex 1, Part 3, Appendix 1. UI FTP5 has been updated to reflect the current text in the 2010 FTP Code and Resolution A.754(18) and to refer to MSC.1/Circ.1435 which is the IMO circular which reflects UI FTP5.

24. UI SC198 (New Corr.1 Sep 2022)

UI SC198 provides interpretation of SOLAS chapter II-2 regulation 10.5.6.3 as amended by resolution MSC.338(91). This revision is amended for editorial purposes.

25. UI HSC8 (New Corr.1 Sep 2022)

UI HSC8 regarding the protection of load bearing structures provides interpretation of paragraph 7.4.2.3 of the 2000 HSC Code. UI HSC8 is updated to include a reference to the related MSC.1/Circ.1457.

26. UI FTP2 (Del. Oct 2022)

UI FTP2 is deleted as its contents are contained in the FTP Code.

27. UI SC250 (New Corr.2 Nov 2022)

UI SC250 provides interpretation of the IMSBC Code, as amended by resolution MSC.462(101) on fire-extinguishing arrangements in cargo spaces. This revision is updated for editorial purposes.

28. UI SC32 (Del. Nov 2022)

This UI has been deleted as the interpretation is included in the FSS Code.

29. UI SC60 (Del. Nov 2022)

This UI has been deleted as the interpretation is included in the FSS Code.

30. UI LL61 (Del. Nov 2022)

UI LL61 is deleted as the contents of the UI are now taken into consideration in the 2008 IS Code.

31. UI FTP4 (Rev.2 Nov 2022)

UI FTP4 provides interpretation of 2010 FTP Code (MSC.307(88)) about fire resistant windows on tankers. UI FTP4 is updated to refer to the current testing of windows, fire dampers, pipe penetrations and cable transits contained in the Appendix of the FTP Code (MSC.307(88)).

32. UI SC298 (New Dec 2022)

This unified interpretation intends to clarify the phrase "installed on or after 1 January 2024" used in various IMO performance standards, related to GMDSS radio installation, adopted at MSC 105 to supplement the amendments to SOLAS IV, as adopted by resolution MSC.469(105).

33. UI MPC14 (Rev.3 Dec 2022)

UI MPC14 provides interpretation of Annex VI of MARPOL 73/78 and this revision takes into account the criteria for ships in IMO Resolutions MEPC.324(78) and MEPC.328(76).

Summary of New/Revisions to IACS Recommendations published in 2022

New Revised Corrigenda Deleted/Withdrawn

Index	Resolution no.	Revision	Adoption	Title	Implemention Date
1	Rec 105	Rev.1 Corr.1	Jan 2022	Qualification scheme for welders of aluminium alloys	-
2	Rec 165	Rev.1	Jan 2022	Recommendation for assessing design instances based on application of alternative methods in the hull structural design of CSR ships	-
3	Rec 95	Rev.1	Mar 2022	Recommendation for the application of SOLAS regulation V/15 Bridge Design, Equipment Arrangement and Procedures (BDEAP)	-
4	Rec 166	New Corr.2	Apr 2022	Recommendation on cyber resilience	-
5	Rec 170	New	May 2022	The term of "heavy load carrier" for the application of EEDI/EEXI and CII	-
6	Rec 171	New	Jun 2022	Recommendation on incorporating cyber risk management into Safety Management Systems	-
7	Rec 172	New	Jun 2022	EEXI implementation guidelines	-
8	Rec 134	Rev.1	Oct 2022	Boat transfers safe practice	-
9	Rec 60	Rev.1 Corr.1	Nov 2022	Intact stability of tankers during liquid transfer operations	-
10	Rec 173	New	Nov 2022	Guidelines on numerical calculations for the purpose of deriving the Vref in the framework of the EEXI regulation	-
11	Rec 34	Rev.2	Dec 2022	Standard wave data	-

1. Rec 105 (Corr.1 Jan 2022)

Rec 105 provides guidance for a qualification scheme for welders intended to be engaged in welding of aluminium alloys specified in UR W25 for hull structures. This revision has been updated to make minor editorial amendments.

2. Rec 165 (Rev.1 Jan 2022)

Rec 165 gives recommendations for assessing alternative (novel) design instance and alternative (novel) design method (technology). This revision has updated guidance for the assessment of alternative (novel) design instances and conventional designs for which alternative (novel) design methods (technology) or alternative design and calculation methods were applied during the design process.

3. Rec 95 (Rev.1 Mar 2022)

Rec 95 sets forth a set of guidelines for determining compliance with the principles and aims of SOLAS regulation V/15 relating to bridge design, design and arrangement of navigational systems and equipment and bridge procedures when applying the requirements of SOLAS regulations V/19, 22, 24, 25, 27 and 28 at the time of delivery of the newbuilding. After a 10th anniversary review, references to external documents were amended and a new line for BNWAS alerts were included in this revision.

4. Rec 166 (Corr.2 Apr 2022)

Rec 166 provides technical information to stakeholders for the development of cyber resilient ships, whose resilience can be maintained throughout their service life. This revision has been updated to incorporate the new paragraph 1.1.6 to specify the relationship between Rec 166 and the new UR E26 Cyber Resilience of Ships.

5. Rec 170 (New May 2022)

Rec 170 provides recommendations on the term of "heavy load carrier" for the consideration of application to EEDI/EEXI and CII, associated with the definition in Regulation 2.2.15 of MARPOL Annex VI.

6. Rec 171 (New Jun 2022)

Rec 171 has been developed with a view to addressing cyber safety issues within the context of MSC-FAL.1-Circ.3, Guidelines on Maritime Cyber Risk Management.

7. Rec 172 (New Jun 2022)

Rec 172 has been developed in response to Resolutions MEPC.333 (76), MEPC.334 (76), and MEPC.335 (76) relating to EEXI.

8. Rec 134 (Rev.1 Oct 2022)

Rec 134 provides classification societies with reference information to be used in developing Boat Transfer procedures or technical instructions for their surveyors, according to a common reference standard of good practice. This revision has been updated to align provisions of the document with Members' own internal procedures/rules, their experience/expertise, as well as relevant requirements/guidelines of IMO, ISO/IEC standards, other international standards, and best practices within the industry.

9. Rec 60 (Corr.1 Nov 2022)

Rec 60 provides recommendations for tankers which are not subject to MARPOL Annex I Regulation 27 regarding intact stability during liquid transfer operation. The Corr.1 updates footnote 2 to refer to the 2008 IS Code rather than UI LL61 which is proposed for deletion.

10. Rec 173 (New Nov 2022)

Rec 173 contains a set of requirements for numerical calculations to be used for the purposes of deriving the Vref in the framework of the EEXI Guidelines.

11. Rec 34 (Rev.2 Dec 2022)

Rec 34 provides advice on sea states by specifying wave spectrum, spreading, heading distribution and vessel speed. Following indications that the representation of North Atlantic waves in Rec 34 (Rev.1 2001) may have become outdated, IACS began work in 2018 on a long-term review of wave data. In this revision of Rec 34, IACS has derived significant wave height from modern data sources for North Atlantic accounting for more extreme weather experienced in recent years, including the possible effects of climate change.

Appendix II

Summaries of IACS Member's Class Report Data 2022

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	**8,236**	**406,878,379**	**265,075,965**	**1,905**	551	1,354	**121**
Tankers (crude, product & gas)	2,049	192,289,221	118,436,865				
Container vessels	711	55,035,944	49,294,001				
Dry bulk	1,224	120,083,781	65,341,559				
Passenger vessels (over 12 pax)	46	308,679	388,698				
Other ship types	4,206	39,160,754	31,614,842				

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	**9,372**	**206,115,604**	**142,711,043**	**1,311**	373	938	**124**
Tankers (crude, product & gas)	1,646	60,711,816	41,248,219				
Container vessels	674	28,506,312	25,480,926				
Dry bulk	1,152	87,586,967	48,275,502				
Passenger vessels (over 12 pax)	449	789,819	4,575,517				
Other ship types	5,451	28,520,690	23,130,879				

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	**4,845**	**224,617,285**	**141,602,498**	**1,362**	296	1,066	**59**
Tankers (crude, product & gas)	1,194	57,167,571	33,933,880				
Container vessels	463	28,198,979	25,712,327				
Dry bulk	1,709	133,796,488	74,054,790				
Passenger vessels (over 12 pax)	197	430,364	1,764,149				
Other ship types	1,282	5,023,883	6,137,352				

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	**90**	**3,282,093**	**2,284,894**	**61**	22	39	**23**
Tankers (crude, product & gas)	30	2,564,797	1,557,514				
Container vessels	0	0	0				
Dry bulk	20	697,012	601,350				
Passenger vessels (over 12 pax)	11	6,110	49,545				
Other ship types	29	14,174	76,485				

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	**8,250**	**357,525,238**	**275,335,573**	**1,782**	546	1,236	**100**
Tankers (crude, product & gas)	1,883	153,418,799	95,020,769				
Container vessels	1,752	108,132,202	95,964,670				
Dry bulk	903	60,880,541	34,286,839				
Passenger vessels (over 12 pax)	325	980,934	10,692,742				
Other ship types	3,387	34,112,762	39,370,553				

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	**1,194**	**31,734,004**	**19,021,651**	**215**	63	152	**47**
Tankers (crude, product & gas)	300	23,399,567	13,563,495				
Container vessels	30	875,331	680,167				
Dry bulk	115	5,940,868	3,277,714				
Passenger vessels (over 12 pax)	49	27,417	107,444				
Other ship types	700	1,490,821	1,392,831				

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	**2,063**	**118,121,241**	**77,616,986**	**650**	106	544	**80**
Tankers (crude, product & gas)	744	43,071,216	26,496,065				
Container vessels	302	14,193,695	12,683,823				
Dry bulk	482	55,251,476	29,502,704				
Passenger vessels (over 12 pax)	14	56,786	173,546				
Other ship types	521	5,548,068	8,760,848				

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	**6,580**	**329,824,677**	**229,725,159**	**1,495**	555	940	**115**
Tankers (crude, product & gas)	1,889	161,409,970	103,413,562				
Container vessels	626	42,973,917	39,211,625				
Dry bulk	1,288	115,108,758	62,934,763				
Passenger vessels (over 12 pax)	373	1,518,280	12,792,114				
Other ship types	2,404	8,813,752	11,373,096				

Appendix II Summaries of IACS Member's Class Report Data 2022

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	**7,676**	**427,354,416**	**266,753,218**	**1,406**	213	1,193	**108**
Tankers (crude, product & gas)	1,368	73,476,645	46,651,181				
Container vessels	671	30,326,675	27,723,203				
Dry bulk	4,143	305,417,408	168,991,343				
Passenger vessels (over 12 pax)	7	18,059	108,061				
Other ship types	1,487	18,115,629	23,279,430				

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	**461**	**13,789,351**	**8,163,651**	**95**	33	62	**42**
Tankers (crude, product & gas)	53	8,885,403	4,670,629				
Container vessels	6	88,973	70,207				
Dry bulk	84	3,266,677	1,964,288				
Passenger vessels (over 12 pax)	45	77,381	361,462				
Other ship types	273	1,470,917	1,097,065				

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	**4,697**	**77,068,659**	**63,682,046**	**609**	96	513	**107**
Tankers (crude, product & gas)	704	26,429,228	15,520,562				
Container vessels	183	5,566,612	5,872,277				
Dry bulk	549	34,679,305	20,221,856				
Passenger vessels (over 12 pax)	574	1,293,890	9,442,991				
Other ship types	2,687	9,099,624	12,624,360				

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.

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