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IACS Common Structural Rules review

Key Messaging Brief

Set out below are the messages that IACS needs to deliver to the market in order to fulfil its communication requirements in respect of the Common Structural Rules (CSR) changes.

These messages will seek to educate and explain the changes being made, the purpose behind the CSR review, the opportunity that the review presents, and the benefits that the changes will deliver. Through this, our goal is to persuade key stakeholders of the merits of the CSR review, to encourage them to support the changes, and finally, to address any concerns and correct any misconceptions over the reasons for the review, the process being followed, the changes being made and the impact of those changes.

Our over-arching messages should be stakeholder-agnostic. More detailed and specific messages for IACS's three key segments (ship owners, shipyards and Flag States) is further below.

Background and over-arching messages:

- The International Association of Classification Societies (IACS) has carried out revisions to the Common Structural Rules (CSR) as part of the continual 'class cycle' of review and improvement, and based upon observations from the International Maritime Organization (IMO). The revisions reaffirm IACS's commitment to maintaining the highest standards.
- The CSR set the standards for the construction and maintenance of bulk carriers and oil tankers. These rules aim to ensure safety, structural integrity, and environmental protection, and meet the Goal-Based Standards (GBS) for continuous improvement set by the IMO. They were last significantly updated in July 2016, with regular smaller adaptations since then.
- Casualty statistics underscore the positive impact of the Enhanced Survey Programme (ESP), Performance Standard for Protective Coatings (PSPC), and the CSR. These protocols, in combination, represent the pinnacle of safety standards for oil tankers and bulk carriers constructed since the early 2000s. Additionally, data from special surveys, including steel repair and thickness measurements, show significant improvements following the implementation of these standards.
- CSR revisions are based upon a mentality that seeks to consistently evolve in line with new, improved techniques, and data, including - for example - new hydro-dynamic calculation techniques. Data is constantly gathered and assessed from several touchpoints, including newbuild and five-year surveys, and data collected during the ship recycling phase, as well as during R&D.
- The basis for revisions to CSR (including new wave loads, and other subsequent rule changes) will be more transparent and accurate as it is based on more realistic and validated data and experience gained in service, and a more comprehensive and technically sound background compared to the previous CSR.
- Enhanced data can better 'future proof' the CSR against future developments - including the demands of a new multi-fuel and clean technology future where vessel design and operation will become less standardised - allowing for better preparedness



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- Despite these advancements, IACS acknowledges that a state of continuous 'class cycle' improvement needs to be maintained. We are committed to amending the CSR where needed, not to dilute standards, but to enhance them further. This includes the incorporation of innovative techniques such as mapping of weather conditions which the existing fleet has been exposed to and global wave load analysis by Computational Fluid Dynamics (CFD), which were not feasible two decades ago.

The rationale for updating CSR

- Current Common Structural Rules (CSR) are based on wave data that is now outdated. This aging data does not reflect the advances in technology, materials, and design methodologies that have emerged in recent years.
- Since the last major revision of the CSR, significant technological advances have been made. These include improvements in simulation tools and wave load analysis techniques, which can now be better integrated into the rules to enhance safety and efficiency.
- The shipping industry has also evolved, with new challenges and changes such as digitalisation and environmental concerns becoming more prominent. A review of the CSR is essential to ensure that the rules remain relevant and continue to support safe and sustainable shipping practices.
- The proposed revisions capitalise on advancements in technology and data collection methods; providing more comprehensive and accurate wave data, utilising factors such as ship speed, heading angle, and ships' position. These enhancements represent a significant improvement to modelling real-world conditions, supporting the ongoing evolution of ship design and safety measures.
- CSR changes would not necessarily lead to increased steel requirements. More complex calculations for general ship design based on state-of-the-art computational tools will give a much clearer and realistic indication of how the design can be improved.
- IACS prioritises safety and is committed to considering the interests of all stakeholders as part of its continuous improvement efforts, including the CSR revisions.

A rigorous, inclusive and transparent process

- It is vital that CSR revisions are made with all stakeholders in mind, and as part of a truly collaborative process. Revisions to CSR are subject to extensive scrutiny by all stakeholders (including, but not limited to an external advisory group (EAG), IACS members' technical committees, and wider industry consultation). All rule changes are accompanied by detailed technical background documents, ensuring a fully transparent process.
- The revision of the CSR is a comprehensive and rigorous process, taking several years in total to complete. It has intentionally been designed to be inclusive and transparent, allowing for extensive consultation with flag states, shipowners, shipyards, and other key stakeholders.
- Stakeholders are encouraged to actively participate in the consultation process, providing feedback and suggestions to ensure that the revised rules are practical, effective, and beneficial for the entire industry.
- This inclusive process shall remain in place through to the adoption and entry into force of any new rules. To facilitate a smooth transition, IACS is aware that there may be a rationale



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for allowing additional time for implementation. This proposal is currently under internal discussion by the IACS Council.

- To ensure that the new CSR for Bulk Carriers and Double Hull Oil Tankers are thoroughly reviewed, IACS will follow a structured timeline. This timeline is designed to allow for all stakeholders to have the time and opportunity to contribute to the process, and outlines key milestones and activities necessary to achieve this goal.
- An extended timeline for implementation has been proposed to allow all stakeholders sufficient time to adapt to the new rules without undue pressure, ensuring a smooth transition. The revision process as whole has several staging posts to ensure that at each stage the work conducted is comprehensive and then fully reviewed to ensure that all safety factors are considered, and, where applicable, improved. This includes:

Key adaptations (on current CSR development):

- The updated CSR will incorporate the latest safety standards, which are based on more accurate and recent data. This will lead to improved ship design and construction, ultimately helping to reduce the risk of accidents at sea.
- The revised CSR based on Rec.34 Rev.2 will result in higher wave loads than current CSR and allows for greater preparedness in meeting the demands of inevitable changes to environmental standards, including provisions for more environmentally friendly ship designs, adding new clean technology such as wind propulsions or air lubrication, and adapting to new fuel types.

New wave loads based on IACS Rec.34 Rev.02

- The revision of the IACS Rec. 34 is a fundamental piece of work defining the rule wave scatter diagram. This was prompted by an IMO observation to consider the possible increase of design waves due to climate change.
- In carrying out this review, IACS derived the wave scatter diagram from comprehensive wave and AIS data, according to a clear scientific methodology and site measurements. Critically, this was not based on visual observations, which was previously the practice.
- The change is based upon a complete change of the methodology for collection of data, which is now much more robust. However, this methodology does not enable predictions of various future sea state situations. Therefore, it is important to recognise the possibility that the rule wave scatter diagram might be affected by climate changes in the future.
- It was acknowledged that there were several challenges in the previous version of IACS Rec.34, which relied upon outdated wave data (Global Wave Statistics (GWS) – Visual observations BMT Atlas, 1986).
- The interim GBS Audit on Rec 34 Rev 2 recognised the proactive steps taken by IACS in providing evidence and background information on the wave data and methodologies used, particularly concerning ships position which will depend on trading routes and seaman ship considerations.
- The audit also suggested means of enhancing data validation, and IACS is committed to continuous improvement and may consider further updates. This commitment to refinement ensures that our approach remains robust and responsive to the evolving conditions of sea



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states, including such considerations of ship operations as speed, heading angle, and position.

- Improvements in the latest version of IACS Rec.34 Rev.02 include:
 - The utilisation of more precise and comprehensive wave data based on Global Wave Model using thirty years of data from 1990 to 2020, that enables a validation of wave data with altimeters and buoys.
 - The synchronisation of ship traffic and weather data with extensive AIS data (7 years data from 2013, ~17 billion recording worldwide, ~5 billion hourly recordings worldwide, ~100,000 distinct IMO numbers – vessels).
 - The inclusion of all onerous conditions observed by trading vessels in the North Atlantic area during this period.
 - Updates to the spectrum shape and the spreading function based on hindcast models; accurately representing the wave climate encountered by trading vessels and provides sufficient data to respond to changes in sea state situations compared to current data.
 - Adherence to the main principles of the current CSR while updating wave loads (motions, accelerations, hull girder loads and dynamic sea pressures) based on IACS Rec.34 Rev.2.
 - Inclusion of up to 4 million evaluations of linear statistical analyses for 200 vessels using the latest wave load calculation tools developed over the past 10 years.
 - New wave loads align well with the results of direct analyses based on Rec.34 Rev.2, allowing for improved accuracy.
 - Additional improvements in structural safety, including recalibration of partial safety factor and the introduction of a new vibration factor in fatigue loads.

Stakeholder-specific messages:

Set out below are three sets of messages that are specifically tailored to the interests and needs and three key segments for IACS's Common Structural Rules: ship owners, shipyards and Flag States.

These messages are designed to complement and reinforce the over-arching messages set out above for CSR changes (and must not conflict or undermine them).

Importantly, they are also designed to highlight the specific benefits of the CSR changes for each group and address any specific concerns that may be felt by each of these groups over the impact of the changes. This includes any misconceptions that need to be addressed.

Ship owners

- The revised CSR will ensure higher safety standards, reducing the risk of costly accidents and improving the longevity and reliability of vessels, ultimately protecting assets and investments.
- Incorporating the latest technological advances, the new revised CSR will facilitate more efficient and effective ship designs.



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- The review process includes ample time for consultation, allowing shipowners to provide feedback and ensure that the changes reflect their needs and operational realities.
- Some may fear that the new rules will significantly increase costs. However, the long-term savings through improved efficiency and compliance are likely to outweigh initial expenditures.

Shipyards

- The new revised CSR will streamline the design and construction process, incorporating the latest standards that will reduce rework and enhance the quality and safety of newbuilds. Corrosion additions determined based on statistical analysis, and presented to the industry for consultations, have later been supplemented with information about actual steel repairs. The latest study clarified that repairs due to localized corrosion in ballast tanks is still quite common.
- By aligning with the latest industry innovations, the revised rules will enable shipyards to offer cutting-edge vessels that meet the highest safety and environmental standards, attracting more business.
- The updated CSR will also provide clarity and consistency, reducing uncertainties in the construction process, which will help in planning and managing projects more effectively.
- The proposed extended timeline ensures that shipyards will have sufficient time to adapt to the new requirements, with opportunities to consult and influence the final rules.
- Concerns about increased complexity in the construction process are unfounded; the revisions are designed to simplify and standardize practices, ultimately easing the construction workflow.
- The review process includes ample time for consultation, allowing shipyards to provide feedback and ensure that the changes reflect their needs and operational realities.

Flag States

- The revised CSR will enhance the safety and environmental compliance of vessels, reducing the risk of accidents and environmental incidents.
- New wave loads developed using state of the art calculation tools and new wave scatter diagram in Rec.34 Rev.2 can be transparently implemented without correction factors, are conservative compared with existing rules and fit experience collected from IACS members.
- The revised CSR will initially be adopted by IACS. Following this, the IMO and Flag States will be invited to consider and review the recommendations emerging from the IMO GBS audit once they are formally adopted. This process ensures that the new standards are carefully evaluated and aligned with global best practices.
- By supporting the adoption of the revised CSR, Flag States will have the opportunity to demonstrate leadership in maritime safety and environmental stewardship, further solidifying their commitment to upholding the highest global standards.



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- The CSR revision process allows for extensive consultation with Flag States, ensuring that their concerns and needs are adequately addressed in the final rules.
- The primary focus remains on safety and environmental stewardship, which are critical to the integrity of Flag States.
- The review process includes ample time for consultation, allowing shipowners to provide feedback and ensure that the changes reflect their needs and operational realities.
- All CSR revisions are subject to IMO GBS audits to ensure compliance with respective Goals and Functional Requirements.



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Appendices

Key timelines:

- **Q1 2024: Consequence Assessment initiated:**
 - Begin detailed consequence assessment calculations for net and gross scantlings based on new wave loads and keeping the current corrosion additions.
 - Start internal discussions on preliminary findings and implications.
- **Q2 2024: Industry Consultation:**
 - Engage with industry stakeholders to present initial assessment results.
 - Collect feedback and input on the proposed changes and their potential impact.
 - Hold workshops and meetings with shipbuilders, operators, and other key stakeholders.
- **Q3 2024: Technical Revisions and Analysis:**
 - Refine the technical revisions based on industry feedback and further analysis.
 - Conduct extensive evaluations and simulations to validate new wave load data and structural safety enhancements.
 - Develop comprehensive technical background documents and consequence assessment reports.
- **Q4 2024: Draft Rule Revisions:**
 - Prepare draft revisions of the CSR incorporating the latest technical data, industry feedback, and technological advancements.
 - Share draft revisions with internal IACS committees for initial review and feedback.
- **Q1 2025: Internal Review and Refinement:**
 - Conduct thorough internal reviews of the draft revisions.
 - Make necessary refinements and adjustments based on internal feedback.
 - Ensure alignment with IMO Goal-Based Standards (GBS) and verification audit findings.
- **Q2 2025: Public Consultation:**
 - Release draft rule revisions for public consultation.
 - Facilitate a period for public comments and feedback.
 - Organize public webinars and information sessions to explain the proposed changes and gather broader input.
- **Q3 2025: Final Revisions and Validation:**
 - Analyse public consultation feedback and incorporate valid suggestions into the final revisions.
 - Conduct final validation tests and simulations to ensure the robustness and accuracy of the revisions.
 - Prepare final technical background documents and consequence assessment reports.
- **Q4 2025: Submission to IMO:**
 - Submit the final CSR revisions to the IMO for Goal-Based Standards (GBS) verification audits.
 - Engage with IMO auditors to address any queries or required clarifications during the audit process.

Commented [CCT1]: To be updated based on decisions on RCP timeline at C90



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Acronyms explained:

1. **IACS (International Association of Classification Societies):** A global organization that develops and applies technical standards to ships and other marine structures.
2. **CSR (Common Structural Rules):** Rules developed by IACS for the design and construction of bulk carriers and oil tankers.
3. **GBS (Goal-Based Standards):** Standards set by the IMO to ensure ships are designed and constructed to meet specific safety and environmental performance goals.
4. **IMO (International Maritime Organization):** A specialized agency of the United Nations responsible for regulating shipping.
5. **Rec.34 (Recommendation No.34):** An IACS recommendation providing standard wave data representing the sea state of the North Atlantic.
6. **ESP (Enhanced Survey Programme):** A survey program introduced in 1996 to improve the safety and condition monitoring of ships.
7. **PSPC (Performance Standard for Protective Coatings):** Standards for protective coatings in ballast water tanks (WBT) and cargo oil tanks (COT) to prevent corrosion.
8. **AIS (Automatic Identification System):** A tracking system used on ships and by vessel traffic services for identifying and locating vessels.