INTERNATIONAL MARITIME ORGANIZATION

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MARITIME SAFETY COMMITTEE
112th session
Agenda item 4

MSC 112/4/3
9 October 2026
Original: ENGLISH
Pre-session public release: ☒

GOAL-BASED NEW SHIP CONSTRUCTION STANDARDS

Improvements to the Revised guidelines for verification of conformity with goal-based ship construction standards (GBS) for bulk carriers and oil tankers (MSC.454(100))

Submitted by ICS and INTERCARGO

SUMMARY

Executive summary:	This document proposes amendments to IMO resolutions MSC 287(87) and MSC.454(100), which govern the verification of conformity with goal-based ship construction standards (GBS) for bulk carriers and oil tankers. The current GBS audit process can result in major changes to rules or rule sets being adopted and implemented before audit activities, consequence assessments, and audit observations have been satisfactorily completed. This can create uncertainty and risk for industry stakeholders and may lead to vessel designs being developed against requirements that subsequently require amendment following completion of the audit process. To address these concerns, this document proposes that at least for major changes to rules or rule sets, the changes may not be adopted or come into effect before satisfactory completion of consequence assessments and GBS audits.
Strategic direction, if applicable:	7
Output:	7.24
Action to be taken:	Paragraph 17
Related documents:	MSC 290(87), MSC 287(87); resolution MSC.454(100); MSC 96/5; MSC.1/Circ.1627 and MSC 111/4

Introduction

1 Experience gained during recent GBS audit activities has highlighted procedural issues associated with the audit requirements for verification of conformity with the goal-based ship construction standards (GBS) for bulk carriers and oil tankers.

2 The co-sponsors note MSC 111's invitation for interested delegations to submit proposals for improving the GBS audit process. This submission is intended to contribute to that discussion by identifying lessons learned and proposing a strengthening of the audit requirements.

Relevant instruments

.1 Resolution MSC 290(87) – confirms the necessary SOLAS amendments to introduce goal-based standards (GBS) for the construction of bulk carriers and tankers.

.2 Resolution MSC 287(87) defines the GBS construction standards for bulk carriers and oil tankers.

.3 Resolution MSC 454(100) provides the audit guidelines for assessing Common Structural Rules against the GBS requirements.

GBS procedural concerns

3 A 2014 IMO GBS verification audit of the Common Structural Rules for Bulk Carriers and Oil Tankers (CSR) recorded an observation (MSC 96/5) on the validity of the North Atlantic Wave Data (IACS Recommendation 34/Rev.1), resulting in the data's subsequent revision[1]. In December 2022, this revised wave data was adopted prior to completion of CSR consequence assessments and prior to the completion of the associated GBS audit activities.

4 Resolution MSC 287(87) includes a presumption that adoption of rule sets can take place before completion of GBS audits, i.e. MSC 287(87) states:

"6.3 conformity shall be considered to remain in effect for rule changes, provided that no verification of rule changes has resulted in a non-conformity"

5 Therefore it is this clause that enables even major changes to rules and rule sets to be adopted and to come into effect before completion of GBS audits and consequence assessments. This presents significant risks, as if audits subsequently require modification to those rules, stakeholders may need to revisit designs, calculations, or approvals that have already been completed.

6 The recent adoption of the revised North Atlantic wave data by the classification society Biro Klasifikasi Indonesia (BKI) provides an example of the unintended consequences that resulted from the premature adoption of the revised wave data. Within the GBS auditor's report (MSC 111/4) it is confirmed:

Non-conformity No.: BKI/2024/NC/03:

No consequence assessment or consistency checks have been submitted by BKI to justify the application of IACS Rec.34/Rev.2 in their rules.

Corrective action:

BKI will postpone the use of Rec. 34/Rev.2 and revert back to the use of wave data as provided by Rec.34 Rev.1.

[1] Within other forums there remain ongoing technical discussions of the methodology used to calculate IACS Rec 34/Rev.2. These discussions are unrelated to this submission which is solely focused on improving the procedural aspects of any future GBS audits. Therefore, sponsorship of this document should neither imply acceptance or rejection of the Rec 34/Rev.2 calculation methodology.

7 Because the revised North Atlantic wave data had been published and adopted in 2022, it appears that BKI had incorrectly assumed it was appropriate to apply the revised wave data within their rules without further consequence assessment. For a period of time, such rules were within the portfolio of adopted and published BKI rules for ship design, thereby exposing industry to the risk of ship designs progressing according to rules which might ultimately not meet IMO GBS requirements.

8 The co-sponsors therefore consider that the purpose of the GBS verification process is best served when, at least for major changes to rules and rule sets, the consequence assessments and GBS audit processes are satisfactorily completed before formal adoption and implementation of revised rules.

Wider concerns

9 While IMO's influence over class rules is limited to the CSR and associated standards (e.g. the North Atlantic Wave Data), it is important to also be aware of the potential wider impact of the revision of the wave data. This has for several decades been the industry benchmark for the most onerous environmental conditions experienced by ships. There are many other sets of class rules that utilize it, as do test tanks and research organizations. It is also referenced by IMO's Second Generation Intact Stability. Therefore, although the IMO GBS Auditor's 2014 observation was intended to ensure GBS compliance of the CSR, the early adoption of the revised wave data prior to the completion of consequence assessments has potentially far-reaching impacts for industry.

10 In June 2025, the Shanghai Rules and Research Institute of the China Class Society (XuMin)[2], published a comprehensive assessment of the impacts of changing from Rec.34/Rev.1 to Rev 2. Their study considered ship lengths from 100 to 400 metres for 22 ships of 8 different types. The impacts on motions, accelerations, moments shear forces and sea pressures were assessed. In nearly all cases a reduction was found, typically in the range of 10% to 40%. The study team concluded:

> "The new wave scatter chart is also quite different in terms of form and wave statistical data combination distribution, which is bound to have a far-reaching impact on the future structural standards and design of seagoing vessels, and it is necessary to carry out research as soon as possible to cope with this change."

Therefore, it is apparent from this study that following the adoption of Rec 34/Rev.2, and even to such an authoritative body as the Shanghai Rules and Research Institute, it was unclear what the full consequences of the adoption would be.

11 The categorization of the auditor’s 2014 comments as an observation, as opposed to a non-compliance should not be interpreted as meaning the resulting revision of the wave data is of little consequence within the audit process. The observation triggered a major change to the CSR, and it is indeed difficult to envisage a set of data that is as consequential to the design of ships as the Rec 34 wave data.

12 Historically, the need to revise the wave data has been infrequent and therefore the present circumstances may be seen as unusual. However, with global warming, both the rate of climate change and the impact on the global metocean conditions is difficult to predict. Therefore, there will be a need for more frequent reviews of the wave data going forward. Hence it is likely that similar circumstances will arise again, and it is important to ensure that lessons are learned, and the GBS procedures are strengthened accordingly.

[2] XuMin. Impact of Rec. 34 standard wave data, update on ship's wave load. June 2025.

Proposed amendments

13 The co-sponsors propose the amendments to resolutions MSC 287(87) and 454(100) detailed within the annex to this document.

14 The amendments within the annex of this document are proposed as a feasible option to address the concerns highlighted in paragraphs 3 to 12. Nevertheless, the co-sponsors remain open to further discussions within MSC, a sub-committee, or an associated working group, that may lead to alternative solutions that address the same issues.

15 The references to "major changes" within the annex are predefined within paragraph 5.21 of resolution MSC.454(100), which categorizes changes as per table 1 below. As the revision of the wave data has changed the basis for load determination, it clearly falls within the definition of a "major change".

Table 1: Resolution MSC.454(100) categorization of rule changes

Category	Designation	Explanation
1	Corrigenda and follow-up change	Editorial corrigenda; or rule changes reflecting amendments to IMO mandatory instruments
2	Minor change	Change or deletion of a rule requirement or addition of new requirements not belonging to categories 1 or 3
3	Major change	Change of basic methodology or technology or basic assumptions, e.g. changing the basis for load determination; introduction of new technologies which will require change of permissible values (acceptance criteria), etc.

16 In paragraph 27.4 of resolution MSC.454(100) it is already required for the submitter and auditors to agree the categorization of proposed changes, so the co-sponsors' proposal does not add additional administrative burden, but for major changes, merely changes the order in which activities are completed.

Action requested of the Committee

17 The Committee is invited to:

.1 consider the procedural concerns identified in this document;

.2 consider the proposed amendments to resolutions MSC 287(87) and MSC.454(100) contained in the annex, and;

.3 include consideration of these proposals within the terms of reference of the planned MSC 112 GBS Working Group.

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ANNEX

The proposed additions are highlighted in grey:

Resolution MSC 287(87) - Adoption of the International Goal-Based Ship Construction Standards for Bulk Carriers and Oil Tankers

6 Tier III – Verification of Conformity

6.3 Once the rules for the design and construction of bulk carriers and oil tankers of an Administration or recognized organization have been verified as being in conformity with the Standards, this conformity shall be considered to remain in effect for rule changes, provided that no verification of rule changes has resulted in a non-conformity. The exception is Category 3 Major Changes to Rules or Rule Sets. Unless there are overriding safety considerations that require urgent action, Category 3 Major Changes may only be adopted and come into effect following the satisfactory closing of all GBS audit improvement actions, corrective actions and observations.
Unless the Maritime Safety Committee decides otherwise, any rule changes introduced as a result of verification of conformity shall apply to ships for which the building contract is placed on or after the date on which the rule change enters into force.

Resolution MSC.454(100) - IMO Revised Guidelines for Verification of Conformity with Goal-Based Ship Construction Standards (GBS) for Bulk Carriers and Oil Tankers

Definitions

.9 *Rules* or *rule set* means requirements for hull design and construction of bulk carriers and/or oil tankers operating in unrestricted worldwide service. Within the verification audit process, any information and/or documentation, either supporting or included in the rule development process, which may include guidelines, interpretations, wave data and internal procedures considered necessary to assess the conformity of the rules may be interpreted as a part of the rule set.

Maintenance of verification

27.4 The Organization should review and audit the rule changes received per sub-paragraph .2 every three years. The Secretary-General should establish a Team and forward the compilation of annual changes received per sub-paragraph .2 to it for consideration. Using their professional judgement, the Team should conduct a review of all the changes taking into account the information submitted, particularly the Submitters' categorization of the rule changes and the impact assessment, exchange views and establish an audit plan. Category 3 changes should be subject to audit; category 2 changes may require an audit depending on the impact of the change; category 1 changes need not be audited unless the Team deems it necessary. The Team should provide the audit plan to the Secretary-General for submission to the Committee, and to the Submitters for information.

27.4*bis* Unless there are overriding safety considerations that require urgent action, adoption and coming into effect of category 3 changes may only follow the satisfactory closing of all GBS audit improvement actions, corrective actions and observations.