INTERNATIONAL MARITIME ORGANIZATION

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89th session
Agenda item 5

MSC 89/5
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GOAL-BASED NEW SHIP CONSTRUCTION STANDARDS

Documents submitted to previous sessions of the Committee

Note by the Secretariat

SUMMARY

Executive summary:	As requested by MSC 88, this document provides information regarding submissions under this agenda item to previous sessions of the Committee which had not been fully considered pending finalization of the GBS for bulk carriers and oil tankers
Strategic direction:	10
High-level action:	10.0.1
Planned output:	10.0.1.1
Action to be taken:	Paragraph 7
Related document:	MSC 88/26, paragraph 5.7

Background

1 MSC 88 agreed that work on GBS should continue and, in this respect, supported generally relevant proposals made by Germany (MSC 88/5/1) and the Republic of Korea (MSC 88/5/2), in particular the way forward suggested by Germany, i.e. finalization of the draft Generic guidelines for developing goal-based standards and specification of the acceptable safety level and of the model to determine it. MSC 88 also acknowledged that this would be a longer term project during which a number of unresolved issues needed to be considered, such as the role of FSA in the context of GBS, the availability of relevant data and statistics and the expansion of the scope beyond structural requirements.

2 Consequently, MSC 88 invited Member Governments and international organizations to submit detailed proposals along the lines set out in the above paragraph to this session, and agreed that a GBS/FSA Working Group should be established to finalize the draft Generic guidelines for developing goal-based standards and to consider any proposals submitted.

3 In this connection, MSC 88 requested the Secretariat to submit, to this session, a background document listing any relevant submissions to previous Committee sessions detailed consideration of which had been deferred until after the finalization of the GBS for bulk carriers and oil tankers and include a brief summary of such documents.

Documents on GBS submitted to previous Committee sessions

4 The Secretariat, when researching the issue, found that a total of 157 documents relating to GBS have been submitted under this agenda item to respective sessions (MSC 76 to MSC 88) since the Committee commenced its work on the matter at MSC 76 in December 2002. The complete list of documents issued is set out in the annex, for the information of the Committee.

5 The Secretariat took the instruction of MSC 88 to mean that the list of documents requested should include submissions containing proposals going beyond the development of GBS for bulk carriers and oil tankers only, which, therefore, had not been considered in detail at the relevant Committee meetings.

6 Consequently, the Secretariat identified the following documents and listed them chronologically as follows, including, as requested, a brief summary of their contents:

.1 **MSC 80/6/4** (Germany)

Proposing a general GBS framework consisting of six tiers, including a Tier 0 consisting of top-level safety objectives (high-level performance goals); and introduction of a rule development process based on a risk-based approach.

.2 **MSC 81/6/2** (Denmark, Germany, Norway, Sweden)

Explaining the safety level approach (SLA), including assessment of the actual safety levels of current ship regulations.

.3 **MSC 81/6/3 and MSC 81/INF.7** (Japan)

Providing rational and technical background and information on the methodology of risk-based and safety-level approach, based on the work of the International Ship and Offshore Structure Congress (ISSC).

.4 **MSC 81/6/4** (Japan)

Stating that regulations need to ensure an optimum combination of high level of safety, minimum environmental burden and acceptable social costs and the necessity for the setting of safety levels, accepting that 100% safety or zero risk is impossible.

.5 **MSC 81/6/10** (Japan)

Advocating the introduction of risk (safety level) criteria and the development of IMO guidelines on GBS methodology.

.6 **MSC 81/6/6 and MSC 81/INF.6** (IACS)

Explaining the linkage between FSA and GBS for each GBS tier and each FSA step and the use of Structural reliability Analysis (SRA) for hull structures; and presenting (MSC 81/INF.6) an example for an SRA for hull girder ultimate strength of double-hull tankers.

.7 **MSC 81/6/7** (United Kingdom)

Comparing risk-based and prescriptive approach and concluding that all available tools should be utilized for the development of IMO technical requirements.

.8 **MSC 81/6/8** (Denmark, Germany)

Introducing a "safety knob" to control maritime safety in order to visualize the SLA on the basis of cost of averting a fatality (CAF); and referencing SAFEDOR activities.

.9 **MSC 81/6/14** (Germany)

Presenting an example to illustrate the SLA structure, based on CAF/CATS (cost of averting one tonne of oil spilled) values.

.10 **MSC 82/5/5** (IACS)

Examining Tiers I and II of the GBS for bulk carriers and oil tankers and identifying any changes necessary to adapt them to the SLA.

.11 **MSC 83/5/3** (Report of the SLA Correspondence Group)

Reporting on the progress made by the group with regard to definitions of generic ship types for the purpose of statistical analysis; time windows to be used for historical data when establishing statistics for risk categories; review of available statistical data; linkage between FSA and GBS; consideration of the tier structure; common terminology; and evaluation of the current safety level.

.12 **MSC 83/5/5** (Sweden)

Proposing that IMO develop a framework for a systematic and transparent goal-based rule-making process (guidelines for rule-making procedures), applicable to all IMO instruments, based on systematic and continuous hazard identification and risk analysis, including introduction of a "rule commentary" for all new regulations to be developed.

.13 **MSC 83/5/6** (Netherlands)

Proposing recording background information when (new) regulations are developed (similar to the "rule commentary" proposed in MSC 83/5/5), including reasons for the development of the regulation (what concern does it address), contribution to safety/security, environmental benefits and costs to the maritime industry.

.14 **MSC 83/5/9** (Japan)

Commenting on the categorization of ship types and on the evaluation of the current safety level inherent in IMO regulations; proposing to use Lloyds Register/Fairplay data and to prioritize the ongoing work by limiting evaluation to certain ship types; and that an assessment method for the required minimum safety level on separate functions, e.g., life-saving appliances, fire protection, stability, etc., should be further considered.

.15 **MSC 83/5/10** (Germany)

Proposing to develop more detailed descriptions of the future shape of safety levels and how they relate to existing risk levels, a definition of the system "ship" to understand the risk contributors of the shipping industry; and commenting on the application of the tier system to the SLA, the linkage to IMO's method of work and available ship casualty data.

.16 **MSC 83/5/16** (Republic of Korea)

Commenting on categorization of ship types, time windows to be used for historical data, review of available statistical data, extension of Tier II functional requirements to other aspects and development of common terminology for GBS/SLA.

.17 **MSC 83/INF.4** (Netherlands)

Presenting the results of a research project on goal-based regulations for life-saving appliances.

.18 **MSC 84/5/4** (Denmark, Germany, Sweden)

Containing detailed proposals for a generic framework for GBS, defined as a standard that "determines a goal to be achieved but without specifying the solution", whereby the structure is based on "rules for rules" and "rules for the ship" parts; and illustrating high-level goals and corresponding clusters of functional requirements with examples.

.19 **MSC 84/5/5** (Japan)

Agreeing that the generic framework should contain top-level goals, sub-goals and functional requirements; and providing two examples, for intact stability and structural safety, for further consideration of the methodology to compensate for the gaps between top-level goals and functional requirements.

.20 **MSC 84/INF.5** (Netherlands)

Providing parts of the text of the NATO Naval Ship Code as an example to illustrate how the GBS methodology was applied in the drafting of the Code.

.21 **MSC 85/5/3** (Japan)

Clarifying the definition of SLA and the concept of introducing SLA into GBS, and providing an outline of ongoing work on the issue in Japan.

.22 **MSC 86/5/3** (Denmark)

Presenting guidelines for the approval process of risk-based designed ships, developed, used and tested under the research project SAFEDOR and intended for the use of both authorities and clients/design teams when considering a risk-based design; and providing guidance on various aspects requiring consideration when entering the approval process for alternative designs and arrangements.

Action requested of the Committee

7 The Committee is invited to consider the information set out in this document and take action as deemed appropriate.

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ANNEX

LIST OF MSC DOCUMENTS ISSUED UNDER THE AGENDA ITEM "GOAL-BASED NEW SHIP CONSTRUCTION STANDARDS"

MSC 76

MSC 76/5/10	Greece	Building of robust ships

MSC 77

MSC 77/2/3	IACS	IMO Strategic Plan
MSC 77/2/4	OCIMF	IMO Strategic Plan
MSC 77/2/5	Bahamas, Greece	IMO Strategic Plan – New build standards
MSC 77/2/6	INTERTANKO	IMO Strategic Plan
MSC 77/INF.6	IACS	IMO Strategic Plan – Classification Process

MSC 78

MSC 78/6	Secretariat	Chronological background
MSC 78/6/1	Secretariat	Outcome of MEPC 49
MSC 78/6/2	Bahamas, Greece, IACS	Proposal for the development of goal-based standards
MSC 78/6/3	Poland	Specific concept on goal-based standards
MSC 78/6/4	AWES	Comments on and proposed modifications to MSC 78/6/2
MSC 78/6/5	Japan	Goal-based new ship construction standards
MSC 78/6/6	France	Comments on document MSC 78/6/2

MSC 79

MSC 79/6	Secretariat	Background summary
MSC 79/6/1	Chairman	Issues for consideration
MSC 79/6/2	Marshall Islands	Issues for consideration
MSC 79/6/3	Germany	Guiding strategy
MSC 79/6/4	Poland	Comments on document MSC 79/6/1
MSC 79/6/5	Poland	Concept on ship safety assurance system
MSC 79/6/6 and Corr.1	India	Issues for development and implementation
MSC 79/6/7	United Kingdom, Denmark	Role of the human element
MSC 79/6/8	Greece	Goal-based new ship construction standards
MSC 79/6/9	ICS	Goal-based new ship construction standards
MSC 79/6/10	Ireland	Issues for consideration
MSC 79/6/11	Brazil	Consideration for the improvement of the goal-based new ship construction standards (GBS)

MSC 79/6/12 and Corr.1	Brazil	A goal-based new ship construction standards (GBS) approach
MSC 79/6/13	Republic of Korea	Goal-based new ship construction standards
MSC 79/6/14	Republic of Korea	Potential subjects for consideration
MSC 79/6/15	Denmark, Iceland, Norway, Faroe Islands	Issues for consideration
MSC 79/6/16	Canada	Issues for consideration
MSC 79/6/17	United States	Goal-based new ship construction standards
MSC 79/6/18	Iran, Islamic Republic of	A goal-based new ship construction standards (GBS) approach
MSC 79/6/19	Bahamas	Comments on goal-based standards and formal safety assessment
MSC 79/6/20	Bahamas	Comments on document MSC 79/6/1
MSC 79/6/21	IACS	Comments on document MSC 79/6/1
MSC 79/6/22	Japan	Comments on the issues raised by the Chairman
MSC 79/6/23	Spain	Comments on documents MSC 79/6/1, MSC 79/6/5 and MSC 79/6/10
MSC 79/6/24	United Kingdom	Considerations in setting goals and functions
MSC 79/6/25	United Kingdom	Relationship between goal-based standards, prescriptive regulation and Formal Safety Assessment
MSC 79/6/26	INTERTANKO	Goal-based new ship construction standards
MSC 79/INF.5	Denmark, Iceland, Norway, Faroes	Issues for consideration

MSC 80

MSC 80/6	Chairman of the Working Group	Report of the Working Group on Goal-Based Standards at MSC 79
MSC 80/6/1	Japan	Proposal for Tier I and Tier II of the goal-based new ship construction standards
MSC 80/6/2	Poland	Quantitative criteria
MSC 80/6/3	Bahamas	Comments on document MSC 80/6
MSC 80/6/4	Germany	Introducing goal-based standards (GBS) into the existing regulatory framework
MSC 80/6/5	Greece	Definition of basic parameters for the development of GBS
MSC 80/6/6	Denmark, Norway	General principles for structural standards
MSC 80/6/7	Denmark, Norway	Considerations on some basic building blocks in goal-based standards
MSC 80/6/8	IACS	Determination of actual service life
MSC 80/6/9	IACS	Design life and related lifecycle design parameters
MSC 80/6/10	Iran, Islamic Republic of	Proposal on Tiers I, II and III of the goal-based new ship construction standards

MSC 80/6/11	Republic of Korea	Comments on the report of the Working Group on Goal-Based Standards at MSC 79
MSC 80/6/12	United States	Comments on the report of the Working Group (document MSC 80/6)
MSC 80/6/13	CESA	Comments on draft proposals for Tier I and Tier II
MSC 80/INF.3	Poland	Safety factors and safety margins
MSC 80/INF.4	Poland	Response of ship's structure to waves in different sea areas

MSC 81

MSC 81/6	Chairman of the GBS Working group	Report of the Working Group on Goal-Based Standards at MSC 80 (Part 2)
MSC 81/6/1	United States	Report of the Correspondence Group on Goal-Based Standards
MSC 81/6/2	Denmark, Germany, Norway, Sweden	Safety level approach
MSC 81/6/3	Japan	Safety level approach
MSC 81/6/4	Japan	Japan's position on goal-based new ship construction standards
MSC 81/6/5	Japan	Basic concept of a Ship Construction File (SCF)
MSC 81/6/6	IACS	Linkage between FSA and GBS
MSC 81/6/7	United Kingdom	Where does risk come into the rule development process?
MSC 81/6/8	Denmark, Germany	The safety level approach – introducing the safety knob to control maritime safety
MSC 81/6/9	Iran, Islamic Republic of	Draft Tier III
MSC 81/6/10	Japan	Safety level approach – safety level criteria
MSC 81/6/11	Republic of Korea	Tier III - Verification of compliance criteria
MSC 81/6/12	Republic of Korea	Comments on Tier III - Information and documentation requirements
MSC 81/6/13	Germany	Use of Structural Reliability Analysis in the Safety Level Approach
MSC 81/6/14	Germany	Safety level approach – worked example
MSC 81/6/15	Greece	Linkage between FSA and GBS
MSC 81/6/16	Greece	GBS and the risk/safety level approach
MSC 81/6/17	Greece	Life Cycle Cost and Environmental Impact
MSC 81/6/18	Germany	Comments on document MSC 81/6/1
MSC 81/INF.4	Denmark, Germany, Japan, Norway, Sweden, United Kingdom	Announcement of a workshop to promote the understanding of the "safety level approach" (risk-based approach)
MSC 81/INF.6	IACS	Linkage between FSA and GBS
MSC 81/INF.7	Japan	Safety level approach

MSC 82

MSC 82/5	United States	Report of the Correspondence Group on Goal-Based Standards
MSC 82/5/1	Germany, Sweden	Report of the Correspondence Group on the safety level approach
MSC 82/5/2	Secretariat	Comments on liability and incorporation of GBS into IMO instruments
MSC 82/5/3	Liberia	Consideration of the human element and ergonomics
MSC 82/5/4	Iran, Islamic Republic of	Comments on liability and incorporation of GBS into IMO instruments
MSC 82/5/5	IACS	Draft Tier II – Safety Level Approach
MSC 82/5/6	Republic of Korea	Comments on the report of the Correspondence Group on GBS for bulk carriers and tankers
MSC 82/5/7	Republic of Korea	Comments on the report of the Correspondence Group on the Safety Level Approach
MSC 82/5/8	Japan	Draft Guidelines on goal-based standards
MSC 82/5/9	China	Comments on verification of compliance (Tier III) of GBS
MSC 82/5/10	Japan	Comments to the report of the Correspondence Group on GBS for bulk carriers and tankers
MSC 82/5/11	IACS	Comments to the report of the Correspondence Group on GBS for bulk carriers and tankers

MSC 83

MSC 83/5	Secretariat	MSC's work on goal-based new ship construction standards – an overview
MSC 83/5/1	Coordinator of the Pilot Project	Report of the Pilot project on trial application of the GBS Tier III verification process using the IACS Common Structural Rules
MSC 83/5/2	Sweden	Report of the Correspondence Group on GBS for Oil Tankers and Bulk Carriers
MSC 83/5/3	Germany	Report of the Correspondence Group on Safety Level Approach
MSC 83/5/4	Secretariat	Funding options for a Group of Experts to verify the rules of recognized organizations
MSC 83/5/5	Sweden	On the future of IMO goal-based standards
MSC 83/5/6	Netherlands	Keeping record of the rationale behind regulations
MSC 83/5/7	Denmark	Consideration of GBS and occupational health and safety

MSC 83/5/8	Finland	Comments on the reports of the Pilot Panel and of the correspondence group on GBS for oil tankers and bulk carriers: Ice strengthening
MSC 83/5/9	Japan	Comments on the report of the Correspondence Group on Safety Level Approach
MSC 83/5/10	Germany	Safety level approach – safety levels
MSC 83/5/11	Japan	Comments on the report of the Pilot Panel on the trial application of the Tier III verification process using IACS Common Structural Rules (CSR)
MSC 83/5/12	IACS	Comments on Report of the Pilot Panel on the trial application of the Tier III verification process using IACS Common Structural Rules (CSR)
MSC 83/5/13	Argentina, Spain	Criteria for evaluation of the minimum design load
MSC 83/5/14	Germany	Comments on the Report of the Pilot Panel
MSC 83/5/15	Republic of Korea	Comments on the Report of the Pilot Panel on the trial application of the Tier III verification process using IACS Common Structural Rules (CSR)
MSC 83/5/16	Republic of Korea	Comments on the report of the Correspondence Group on Safety Level Approach
MSC 83/5/17	Republic of Korea	Comments on the report of the Correspondence Group on GBS for bulk carriers and tankers
MSC 83/INF.4	Netherlands	Example of life-saving appliances
MSC 83/INF.5	IACS	Information submitted by IACS to the Pilot Project on goal-based standards for new ship construction for bulk carriers and oil tankers

MSC 84

MSC 84/5	Chairman of the GBS Working Group	Report of the Working Group on Goal-Based Standards at MSC 83 (part 2)
MSC 84/5/1	Secretariat	Need for consequential amendments to IMO instruments
MSC 84/5/2	Coordinator of the Pilot Panel	Interim progress report of the Pilot Panel
MSC 84/5/3	Germany	Report of the GBS correspondence group
MSC 84/5/4	Denmark, Germany and Norway	Consideration of the GBS generic structure
MSC 84/5/5	Japan	Comments on the report of the Correspondence Group on GBS
MSC 84/INF.5	Netherlands	The Naval Ship Code

MSC 85

MSC 85/5	Secretariat	Draft SOLAS amendments to make the GBS for bulk carriers and oil tankers mandatory and related matters
MSC 85/5/1	Coordinator of the Pilot Panel	Report of the Pilot Panel on the trial application of the Tier III verification process using IACS Common Structural Rules (CSR)
MSC 85/5/2	Secretariat	Verification of compliance – Confidentiality statement
MSC 85/5/3	Japan	Definition of SLA and concept of its introduction into GBS
MSC 85/5/4	Japan	Comments on the draft SOLAS amendments for GBS
MSC 85/5/5	CESA	Ship Construction File – Protection of Intellectual Property Rights
MSC 85/5/6	Japan	Comments on net scantling concept in the report of the Pilot Panel
MSC 85/5/7	Japan, CESA	Consideration of the protection of intellectual property rights (IPR)
MSC 85/5/8	Republic of Korea	Comments on the report of the Pilot Panel on the trial application of the Tier III verification process using IACS Common Structural Rules (CSR)

MSC 86

MSC 86/5	Secretariat	GBS for bulk carriers and oil tankers
MSC 86/5/1	Chairman of the GBS Working Group	Report of the Working Group on Goal-based Standards at MSC 85 (Part 2)
MSC 86/5/2 and Corr.1	Germany	Report of the correspondence group on generic guidelines for developing goal-based standards
MSC 86/5/3	Denmark	Guidelines on approval of risk-based ship design
MSC 86/5/4	Canada, Norway, Sweden	Alternative to the GBS verification process
MSC 86/5/5	IACS	Alternative to the GBS verification process
MSC 86/5/6	Spain	Comments on the definition of net scantlings adopted by MSC 85
MSC 86/5/7	Australia	Information to be included in a Ship Construction File
MSC 86/5/8 and Corr.1 (E only)	Spain, INTERTANKO	Comments on the Verification Process (Tier III)
MSC 86/5/9	United Kingdom	Effects of the draft regulation on the implementation of the classification rule amendments to ships
MSC 86/5/10	Norway	Alternative to the GBS verification process – Consequences for SOLAS amendments
MSC 86/5/11 and	Argentina, Spain	Comments on the Verification Process (Tier III)

MSC 86/5/12	Republic of Korea	Comments on the alternative to the GBS verification process
MSC 86/5/13	Greece	Guidelines on approval of risk-based ship design
MSC 86/5/14	RINA	Tier III – Verification of Compliance
MSC 86/INF.3	IACS	Guidelines for structural rule development in IACS
MSC 86/INF.10	CESA, ICS, INTERCARGO, INTERTANKO, BIMCO, OCIMF, IACS	Guideline for ship construction file implementation. A cross industry approach to balance design transparency and intellectual property protection

MSC 87

MSC 87/5	Secretariat	Generic guidelines for developing goal-based standards
MSC 87/5/1	Secretariat	Guidelines for verification of conformity with goal-based ship construction standards for bulk carriers and oil tankers
MSC 87/5/2	Secretariat	Resource requirements and timing of GBS verification audits
MSC 87/5/3	IACS	International Goal-Based Ship Construction Standards for Bulk Carriers and Oil Tankers
MSC 87/5/4	CESA, ICS, INTERCARGO, INTERTANKO, BIMCO, OCIMF, IACS	Guidelines for Ship Construction File implementation – A cross industry model for SCF implementation
MSC 87/5/5 and Corr.1	CESA, ICS, INTERCARGO, INTERTANKO, BIMCO, OCIMF, IACS	Proposed amendments to the Guidelines for Ship Construction File implementation – Balancing design transparency and intellectual property protection
MSC 87/5/6	IACS	Harmonized Common Structural Rules (HSR) for oil tankers and bulk carriers
MSC 87/5/7	Japan	Comments on the draft Guidelines for verification of conformity with goal-based ship construction standards for bulk carriers and oil tankers
MSC 87/5/8	IACS	Comments on resource requirements and timing of GBS verification audits

MSC 88

MSC 88/5	Secretariat	Outcome of MSC 87: future work on goal-based standards
MSC 88/5/1	Germany	A proposal for the further development in consideration of the future safety-level based standards
MSC 88/5/2	Republic of Korea	Information on long-term considerations for the continued development of GBS
MSC 88/5/3	Secretariat	Implementation of the GBS verification scheme – progress report