



MARITIME SAFETY COMMITTEE  
87th session  
Agenda item 5

MSC 87/5  
28 August 2009  
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## GOAL-BASED NEW SHIP CONSTRUCTION STANDARDS

### Generic guidelines for developing goal-based standards

#### Note by the Secretariat

##### SUMMARY

<i>Executive summary:</i>	As requested by MSC 86, the Secretariat prepared a consolidated version of the draft Generic Guidelines for developing [IMO] goal-based standards, as attached at annex.
<i>Strategic direction:</i>	10
<i>High-level action:</i>	10.1.1
<i>Planned output:</i>	10.1.1.2
<i>Action to be taken:</i>	Paragraph 3
<i>Related documents:</i>	MSC 86/26, section 5; MSC 84/WP.4 and MSC 86/5/2

1 MSC 86 agreed to have a principal debate at this session on how to proceed with the work on the item and invited Member Governments and international organizations to submit relevant proposals to this session. In order to facilitate the submission of such proposals, the Secretariat was requested to prepare a document containing a consolidated version of the Generic Guidelines for developing [IMO] goal-based standards for the session.

2 In pursuance of the above request, the Secretariat has prepared the consolidated text of the draft Generic Guidelines, set out in the annex, whereby the Secretariat used as a basis the report of the GBS Working Group at MSC 84 (MSC 84/WP.4) and also took into account amendments to the Guidelines proposed by the GBS Correspondence Group established at MSC 84 (MSC 86/5/2).

#### Action requested of the Committee

3 The Committee is invited to note the information provided and take action as deemed appropriate.

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## ANNEX

DRAFT GENERIC GUIDELINES FOR DEVELOPING [IMO]  
GOAL-BASED STANDARDS**Purpose**

1 These Guidelines describe the process for the development, [verification and implementation] of goal-based standards (GBS) to support regulatory development within IMO. The Guidelines are applicable to [IMO,] Administrations, classification societies recognized by an Administration and others who develop standards for ships. These Guidelines can be used to develop GBS for new areas of concern. The application of GBS will help ensure systematic and consistent development of new rules and regulations.

2 It should be noted that these Guidelines are generic and where they use phrases such as “required level of safety”, this does not imply any preference for a specific technical approach.

**[Definitions]**

3 ***Goal-based standards (GBS)*** are high-level standards and procedures that are to be met through regulations, rules and standards for ships. GBS are comprised of at least one goal, functional requirement(s) associated with that goal, and verification of compliance [that rules/regulations meet the functional requirements including goals]. GBS establish “rules for rules”.

4 ***A goal-based standards framework*** consists of goal-based standards and the associated detailed requirements of rules and regulations for ships (see Figure 1).

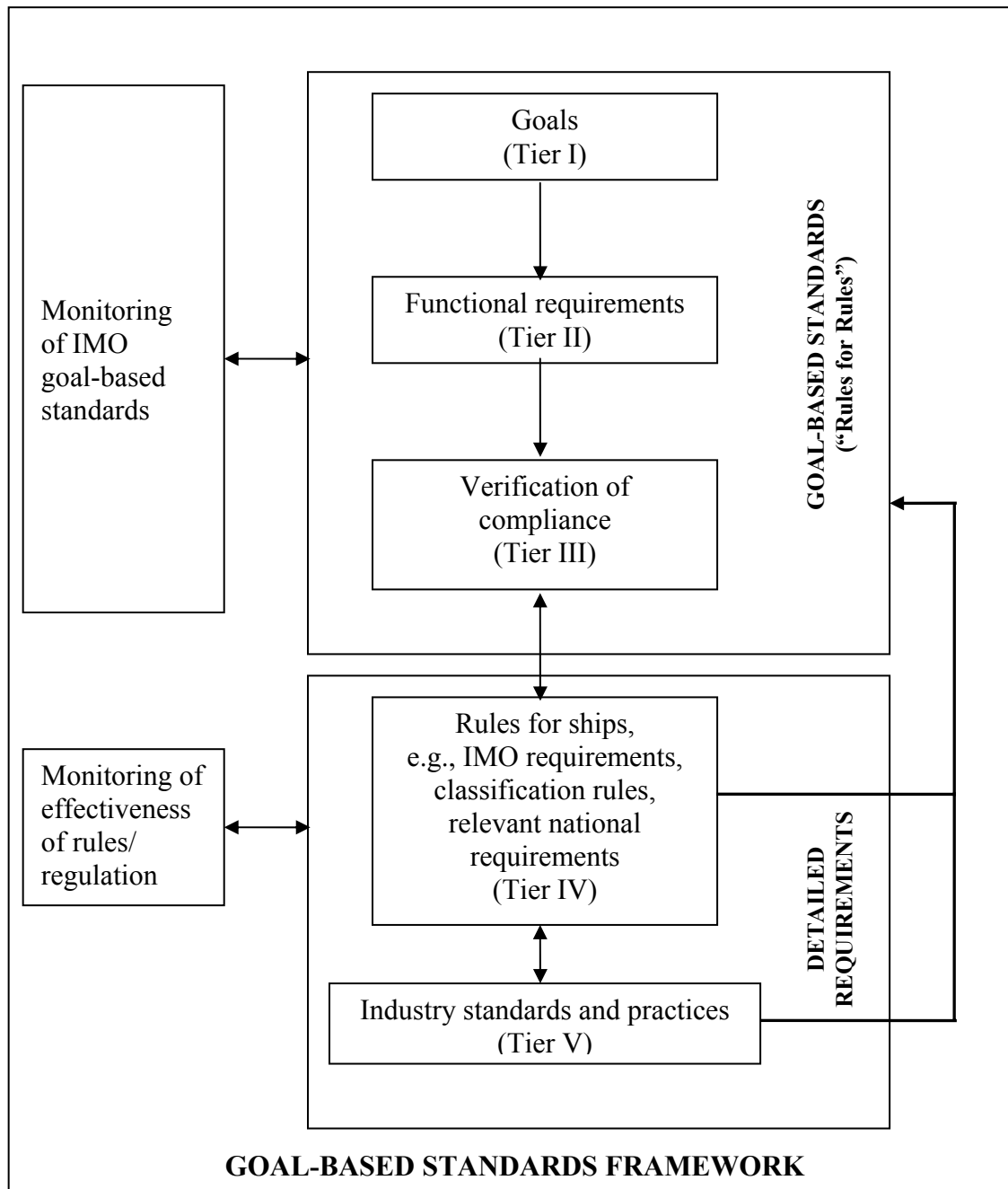
**Basic principles**

5 IMO goal-based standards are:

- .1 broad, over-arching safety, environmental and/or security standards that ships are required to meet during their lifecycle;
- .2 the required level to be achieved by the requirements applied by classification societies and other recognized organizations, Administrations and IMO;
- .3 clear, demonstrable, verifiable, long-standing, implementable and achievable, irrespective of ship design and technology; and
- .4 specific enough in order not to be open to differing interpretations.

**Goals (Tier I)**

6 Goals are high-level objectives to be met. A goal should address the issue(s) of concern and reflect the required level of safety.

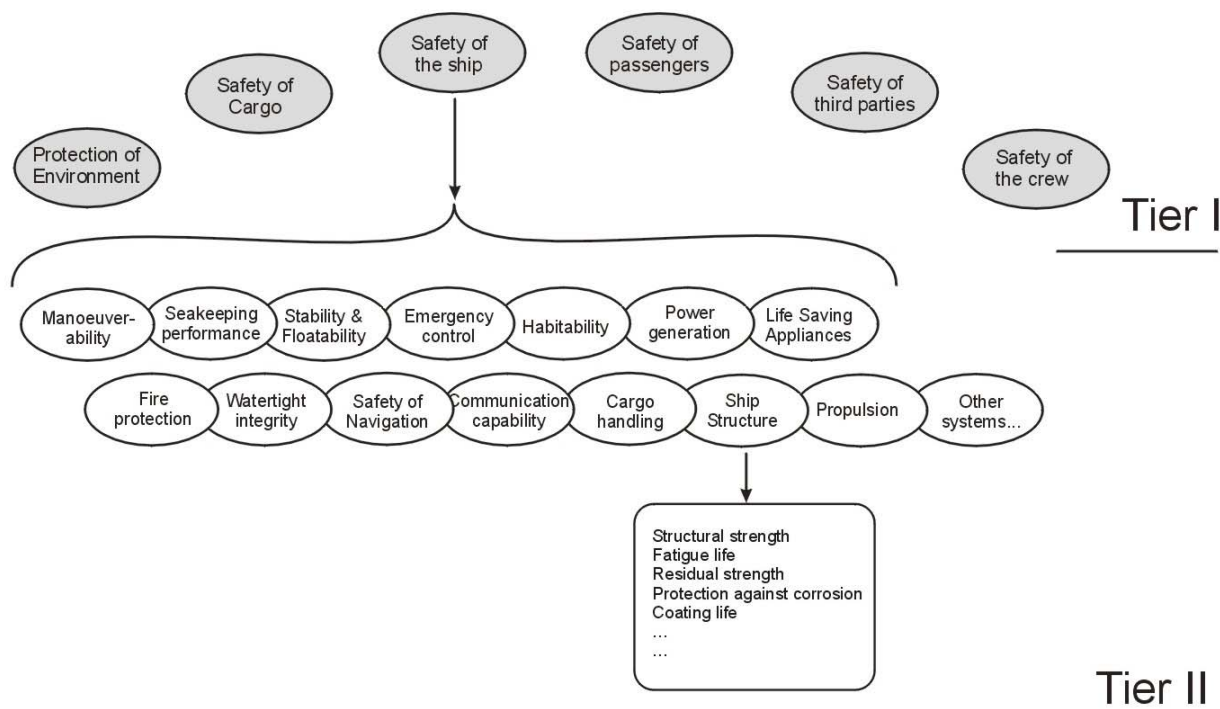


**Figure 1**  
**Goal-based standards framework**

### **Functional requirements (Tier II)**

7 Functional requirements provide the criteria to be satisfied in order to meet the goals. Once a goal has been set, functional requirements are defined. They should cover all functions/areas necessary to meet the goal, and be developed based on experience, an assessment of existing regulations, and/or systematic analysis of relevant hazards.

8 Figure 2 illustrates an example of how goal-based functional requirements for ship structure could be derived.



**Figure 2**  
**Example of how goal-based functional requirements for ship structure could be derived**

### Verification of compliance (Tier III)

9 Verification of compliance provides the instruments necessary for demonstrating and verifying that the associated rules and regulations for ships comply with the goals and functional requirements. The verification process should be transparent and result in a consistent outcome irrespective of the evaluator.

10 The verification process should be focused on the rule/regulations relevant to safety and environmental friendliness.

11 Verification of compliance should establish the method and criteria to be applied during the verification process, and should consider the following elements:

- .1 identification of the functional requirement(s) that are being addressed by the rules/regulations;
- .2 extent to which the rules/regulations cover the functional requirements and contribute towards meeting the goal(s);
- [.3 rule commentary;]

- .4 technical documentation, which may include:
    - .4.1 mechanism of how the rules/regulations meet the functional requirements (operational, technical, design, etc.);
    - .4.2 explanation, including technical background information, of the way the rule/regulation was formulated/drafted; and
    - .4.3 methodology used to derive the rule/regulation along with supporting rationale/justification;
  - .5 quality assurance procedures applied throughout rule/regulation development process; and
  - .6 methods for obtaining feedback on the effectiveness of the rules/regulations and continuous improvement.
- 12 Verification of compliance should:
- .1 be based on techniques varying from first principle models to historic data;
  - .2 be based on analyses using proven, lately established technology;
  - .3 be based on defined clear qualitative and quantitative criteria with a preference of quantitative values; and
  - .4 check whether currently known modes and cases of failure are covered.
- 13 The developer of the rules/regulations under consideration is responsible for performing the analysis required to prove that the rules/regulations comply with the functional requirements the rules/regulations intend to cover.

#### **Rules and regulations for ships (Tier IV)**

14 Rules and regulations for ships are the detailed requirements developed by IMO, national Administrations and/or classification societies and applied by national Administrations and/or classification societies acting as recognized organizations to the design and construction of a ship in order to meet the goals and functional requirements. These detailed requirements become a part of a GBS framework when they have been verified as complying with the GBS.

#### **Industry practices and standards (Tier V)**

15 Industry standards, codes of practice and safety and quality systems for shipbuilding, ship operation, maintenance, training, manning, etc., may be incorporated into or referenced in the rules/regulations for the design and construction of a ship. The responsibility for justifying the suitability of such industry standards and practices, when referenced or incorporated in a rule set, rests with the rule/regulation submitter. This justification should be provided during the verification of compliance process.

## **[Monitoring**

16 Monitoring provides the information that is required in order to ensure the effectiveness of rules and regulations as well as the proactive identification of new risks. In order to verify that the risk of shipping is kept as low as reasonable practicable, safety should be continuously monitored and systematically analysed. The degree of detail for the data recording depends on the item to be monitored.

17 As illustrated by Figure 1 of these Guidelines, two monitoring processes are distinguished:

- .1 the monitoring of the effectiveness of single rules/regulations; and
- .2 the monitoring of the effectiveness of the goals (Tier I) and the functional requirements (Tier II).

18 The monitoring system to be established should address (list without any prioritization):

- .1 safety of passengers;
- .2 safety of third parties;
- .3 occupational safety and health of seafarers;
- .4 safety of ship;
- .5 protection of environment; and
- .6 safety of cargo.

19 For both processes monitoring should consider, but not be limited to, historical data, such as casualty reports, in-service experience, accident investigation, incident reports, near miss reports, new scientific research results as published in the industry, as well as risk analysis.

20 Monitoring responsibilities should be assigned with respect to monitoring tasks as follows:

- .1 Tier I:
  - .1.1 Monitoring (including data collection): IMO
  - .1.2 Analysis: IMO
  - .1.3 Evaluation: Committees
- .2 Tier II:
  - .2.1 Monitoring (including data collection): Sub-Committees
  - .2.2 Analysis: Sub-Committees
  - .2.3 Evaluation: Sub-Committees

.3 Tier IV:

- .3.1 Rules: monitoring (including data collection) and analysis by rule maker, evaluation by rule maker, supervision by IMO?
- .3.2 Requirements: monitoring and analysis by IMO/Sub-Committees, evaluation by IMO/Sub-Committees, maker?

21 The organization(s) responsible for the monitoring and analysis is (are) also responsible for the development and update of the reporting format.]

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**Development of definitions and terminology as needed for effective use of the guidelines**

**Accident:** An unintended event involving fatality, injury, ship loss or damage, other property loss, damage or environmental damage.

**Risk:** The combination of the frequency and the severity of the consequence (MSC 83/INF.2).

**Rule commentary:** Explanation of what functional requirement(s) is (are) intended to be covered by the rule/regulation (section or chapter), and how it is intended to be covered including a synopsis of the analysis performed to prove that the rules/regulations comply with the functional requirements the rules/regulations intend to cover.

**Safety:** Absence of unacceptable levels of risk to life, limb and health (from unwilful acts).

**Evaluation criteria:** Standards, which represent a value-judgement, usually that of a regulation. These are the values used as limits for rule/regulation acceptance.

**Risk evaluation criteria:** Criteria for evaluating that a specific risk level is acceptable.

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