



MARITIME SAFETY COMMITTEE  
84th session  
Agenda item 5

MSC 84/5/4  
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## GOAL-BASED NEW SHIP CONSTRUCTION STANDARDS

### Consideration of the GBS generic structure

#### Submitted by Denmark, Germany and Norway

#### SUMMARY

**Executive summary:** This submission reflects upon the outcome of the IMO GBS development related to the generic structure. The generic structure will enhance the further development in detail and assure that different ongoing work in the committees and sub-committees will converge in the long-term perspective. It is assumed that GBS development will become an overarching element applying the goals and functional requirements for other conventions and standards.

**Strategic direction:** 10

**High-level action:** 10.1.1

**Planned output:** 10.1.1.1

**Action to be taken:** Paragraph 31

**Related documents:** MSC 83/5/5 and MSC 84/5/3

#### Introduction

1 At MSC 83, Sweden outlined in their submission (MSC 83/5/5) a proposal for a long-term work plan for the further development of GBS. One of the elements in the work plan was to develop a generic structure for GBS to ensure a systematic approach and transparency in the rule-making process. The proposal from Sweden touched upon a number of issues concerning the general structure and some of these are further elaborated in this submission.

2 Denmark is of the opinion that GBS should become **the** guiding principles for rule-making in the IMO. Furthermore this submission assumes that GBS development will become a top layer, where goals and functional requirements for other conventions are set out.

3 The specific requirements for the ship will still be placed where they are today (e.g., in SOLAS and MARPOL), even though they may be re-drafted to fulfil the goal-based standards.

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4 Elements of the GBS generic structure have already been agreed in principle during the present development in the GBS working group. Hence, many of the elements in this submission have their origins in various submissions related to the GBS agenda item.

### Generic structure

5 The advantage of developing a generic structure for GBS is evident. Such a structure will serve to support and enhance the further detailed development of GBS, assuring that the varying issues in the ongoing work in the committees and sub-committees will converge in the long-term perspective.

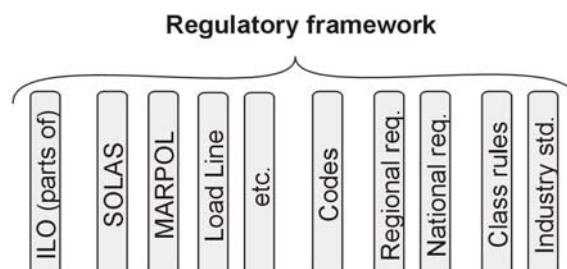
6 As proposed in the Swedish submission, the generic structure could include the following items:

- .1 the basic principles of IMO GBS (as already agreed);
- .2 a general Tier structure in which regulations, rules and standards are to be incorporated (partly agreed, but may need some modifications in order to be suitable for all areas of regulation);
- .3 top-level safety objectives (to be developed based on high-level documents and decisions);
- .4 main areas under which functional requirements are to be formulated, safety monitored and analysed (to be settled for consistency); and
- .5 instructions for the committees and sub-committees on how this structure is to be followed in the rule-making process.

7 This submission only deals with issues .1 to .4.

### Regulatory framework of today and tomorrow

8 The regulatory framework as of today is constituted by a number of conventions and codes such as SOLAS, MARPOL, Load Line and more. Additionally, parts of the ILO, regional and national regulations, along with class rules (among others) play an important role.



9 In many cases the current IMO regulations are a result of failures of safety and the consequence of specific measures against related hazards. This has often resulted in specific detailed measures to mitigate a specific hazard. For that reason the regulatory framework of today is often named as re-active by nature.

10 The GBS framework is still a new concept in comparison with the traditional rule-making process in IMO. The GBS initiative is intended to be pro-active – aiming to prevent the occurrence of accidents. And due to its holistic nature it will provide the IMO with guidance for the further work on improving safety – concurrent with the original intent.

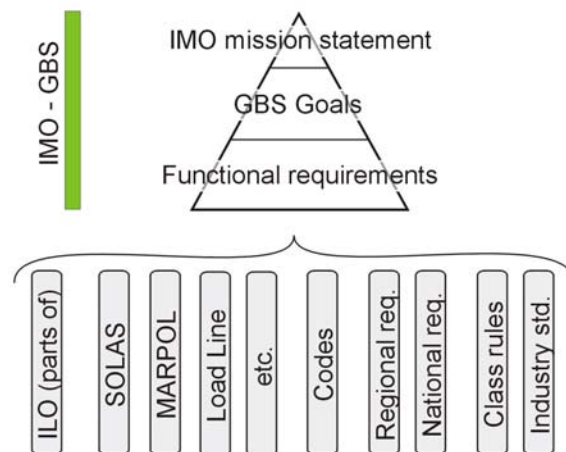
11 As stated in the already agreed basic principles for GBS the overall structure shall be:

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.

12 By applying the wording *broad* and *over-arching* in the basic principles, the intention of GBS is to set up a framework applying the standard and goals for the whole regulatory framework. The advantage of having a GBS top layer – over-arching the other conventions – will be to achieve a simpler approach to detection and rectification of observed deficiencies across the regulatory framework – given the more consistent, verifiable, holistic and transparent approach.

13 It is our understanding that GBS will eventually serve as a means of providing quality assurance to the development of the rules and regulations – be it the IMO conventions or class rules.



### The general Tier structure

14 The general Tier structure will contain two parts as illustrated in the figure above. One part concerns *rules for the rules* and will eventually be the top layer applied. The other part concerns *rules for the ship* illustrated by the regulatory framework as of today.

15 GBS shall, when fully established, refer to all the different key elements linked to the ship design, construction, operation, recycling and environmental requirements – including requirements for the Administration and approval procedures concerning alternative design.

16 Due to the complexity and dispersed coverage of the many varying issues in e.g., SOLAS and MARPOL, it is expected that the GBS framework will have to be divided into a number of high-level goals. Previously, six categories have been introduced (listed below, in random order):

- the safety of the ship
- the safety of the cargo
- the safety of passengers
- the protection of the environment
- the safety of third parties
- the safety and health of the seafarer

17 The functional requirements or functional descriptions referring to the goals may consequently be divided into several clusters under which functional requirements are to be formulated and safety monitored. These are mainly related to specific functions, systems or operations, as in the present regulatory framework.

18 The GBS correspondence group has discussed the composition of clusters which shall embrace the functional requirements:

Referring to ‘*the safety of the ship*’ category:

• Manoeuvrability	• Power supply
• Sea-keeping performance	• Watertight/weathertight integrity
• Stability and floatability	• Navigation
• Emergency control	• Structural integrity
– Life-saving appliances	• Propulsion
– Fire protection	• Communication capability
• Habitability	• Cargo handling

19 This composition fits well into the already established sub-elements of Tier 2 concerning the structural integrity – as already developed by the GBS working group in its ongoing work.

20 The generic structure provides an overview of where we are heading – and where there is a need for further development.

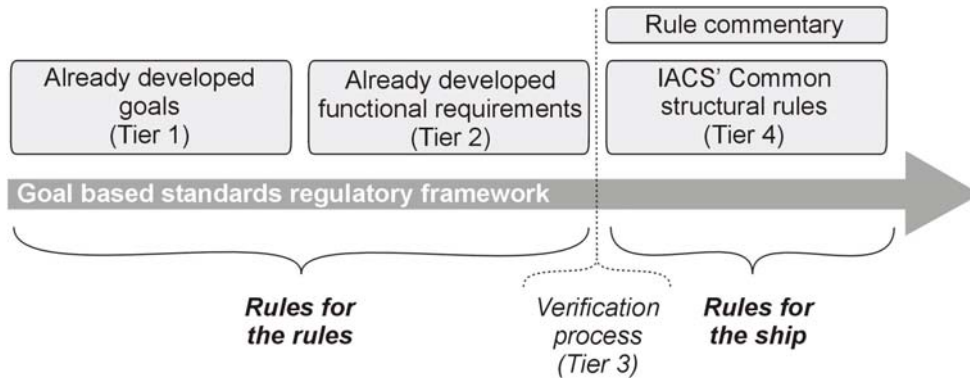
21 The development of the top layer as described can eventually be carried out on a step-by-step basis, whenever there is a need for reviewing the various conventions and relevant chapters.

### **Functional requirements and complying with the goal**

22 The GBS framework should be defined as a standard that “determines a goal to be achieved but without specifying the solution”. The functional requirements (the present Tier 2) in support of the goal will, in that respect, be crucial as they define what is to be achieved and what should be fulfilled. The Tier 2 functional requirement should describe – in prose – the intention behind the requirement, being perfectly aligned with GBS development up to the present day.

23 Each functional requirement will thus explain – in simple, comprehensible terms – why the requirement originally was found justified.

24 The example below refers to the ongoing development in the GBS working group with regard to the Pilot Project and the validation of the Common Structural Rules.



25 How compliance with the goals and the functional requirements is achieved is left to lower level solutions – the *rules for the ship*. In the IMO context this could be solutions as we know them of today condensed from SOLAS, MARPOL, class rules (in the above example IACS Common Structural Rules are chosen), etc.

26 Each regulation set out for the ship should be supported by a commentary describing how the regulation meets the functional requirement. Such commentary should contain background information related to the development of each requirement, supplying the necessary transparency enabling all parties, including the general public, to comprehend and evaluate on the purpose of the regulation and the assumptions made.

### Conclusion

27 The GBS framework will eventually comprise goals, functional requirements and procedures. The regulatory requirements – *rules for the ship* – placed in conventions, regional and national regulations as well as class rules will be required to justify and demonstrate their compliance with the functional requirements of the GBS framework.

28 The advantage of having an agreed generic structure for GBS is obvious. Such structure will enhance the further development in detail and assure that different ongoing work under the committees and sub-committees will converge in the long-term perspective.

29 Once the generic structure is established, SOLAS should be examined chapter by chapter with the purpose of establishing the functional requirements and determining the holistic approach. When the intentions within the regulation are extracted and defined, then the present safety level of the regulation can be determined by use of e.g., FSA.

30 Whenever regulations in the various conventions, etc., are revised, it should be ensured that the revisions are carried out according to the GBS principles.

### Action requested of the Committee

31 The Committee is invited to consider the content of this submission and take action as appropriate.