INTERNATIONAL MARITIME ORGANIZATION

IMO

E

MARITIME SAFETY COMMITTEE
84th session
Agenda item 5

MSC 84/5/3
5 February 2008
Original: ENGLISH

GOAL-BASED NEW SHIP CONSTRUCTION STANDARDS

Report of the GBS correspondence group

Submitted by Germany

SUMMARY

Executive summary:	This documents reports the outcomes of the correspondence group on GBS
Strategic direction:	10
High-level action:	10.1.1
Planned output:	10.1.1.2
Action to be taken:	Paragraph 55
Related documents:	MSC 83/WP.5, MSC 83/5/3, MSC 83/5/5, MSC 83/5/6, MSC 83/5/7, MSC 83/5/9, MSC 83/5/16, MSC 83/5/10, MSC 83/5/12; MSC 82/5/1, MSC 82/5/8; MSC 81/6/8, MSC 81/6/10, MSC 81/6/14; MSC 80/24, MSC 80/4/4 and MSC 72/16

ESTABLISHMENT OF THE CORRESPONDENCE GROUP

1 The Committee, at its eighty-third session, continued its work on goal-based new ship construction standards on two parallel tracks. The first was to continue the development of GBS for bulk carriers and oil tankers with the prescriptive approach and the second to develop GBS based on the SLA (safety level approach).

2 The Committee agreed, in order to progress work on GBS approach between MSC 83 and MSC 84, to establish a correspondence group, under the co-ordination of Germany, with the following terms of reference (TOR):

.1 clarify the work to be done to develop a generic GBS framework based on documents MSC 83/5/5, MSC 82/5/8 and other related documents;

.2 identify and compile the elements of the framework that have already been agreed to or proposed in previous MSC submissions, working group reports or other IMO instruments (e.g., FSA Guidelines, HEAP process guidelines) and identify the existing gaps;

.3 develop a prioritized plan to close the gaps and provide a unified framework that ensures consistent development of GBS, i.e., both the prescriptive and safety level approaches; and

.4 submit a report to MSC 84.

3 The following Member States participated in the work of the correspondence group:

BAHAMAS	MARSHALL ISLANDS
BRAZIL	NETHERLANDS
CANADA	NORWAY
CHINA	PANAMA
DENMARK	POLAND
FINLAND	ROMANIA
FRANCE	SINGAPORE
GERMANY	SOUTH AFRICA
GREECE	SPAIN
INDIA	SWEDEN
IRAN	THAILAND
JAPAN	TURKEY
KOREA	UNITED KINGDOM
MALTA	UNITED STATES

as well as the following Associate Member of IMO:

FAROE ISLANDS

and observers from the following non-governmental organizations:

THE BALTIC AND INTERNATIONAL MARITIME COUNCIL (BIMCO)
COMMUNITY OF EUROPEAN SHIPYARDS' ASSOCIATION (CESA)
INTERNATIONAL CHAMBER OF SHIPPING (ICS)
INTERNATIONAL ASSOCIATION OF CLASSIFICATION SOCIETIES (IACS)
THE INSTITUTE OF MARINE ENGINEERING, SCIENCE AND TECHNOLOGY (IMarEST)
INTERNATIONAL ASSOCIATION OF INDEPENDENT TANKER OWNERS (INTERTANKO)
OIL COMPANIES INTERNATIONAL MARINE FORUM (OCIMF)

4 Germany would like to thank the participants for the contributions they made. Progress was made to identify what was already agreed and the gaps in the results of the previous work. Based on these results a work plan was developed and the work items of this plan were prioritized.

CLARIFY THE WORK TO BE DONE TO DEVELOP A GENERIC GBS FRAMEWORK

5 The discussion on TOR 1 started on the basis of the work plan proposed by Sweden (MSC 83/5/5, paragraph 14). This proposal mentioned the following work items:

.1 agree on a generic structure for GBS that can be applied to different areas of maritime safety and environmental protection;

.2 develop general guidelines for rule-making procedures to follow this GBS structure;

.3 formulate step-by-step functional requirements for all new areas of regulation and for every considered revision of existing regulations;

.4 agree that all new or revised IMO regulations, class rules and other mandatory standards, should be followed by a commentary in an agreed format, explicitly stating which functional requirements are addressed, and the substantial basis for the regulation; and

.5 develop procedures for systematic monitoring of casualty statistics and analysis of risks for ships and individuals based on the same functional requirements identified above.

6 In context with this point some members raised the concern that these items of the work plan were focused on SLA only and it should be checked how the results of the prescriptive approach (pilot study) could be taken into consideration. The opinion was expressed that the TOR are not limited to SLA and thus the results of the bulk carriers and oil tankers pilot study should be taken into consideration, and the items of the work plan contained no point of convergence with the 'prescriptive' approach. One member noted that, if amalgamation proved to be impossible, this should clearly be pointed out and the work should be continued in parallel.

7 Concerning the work plan in general, one member highlighted that the outlined scope was too broad and too general to be of use in the near future. If each area was tackled using risk analysis properly and correctly to avoid oversimplifications, it would take many years, perhaps decades. Presently, SOLAS cannot be replaced by FSA because a long way of serious research would be required before this could be done. Thus, the opinion was expressed, that this work plan was simply an attempt to lay down some general principles with the intention to tackle and complete properly each area separately in the future. For the time being, the SLA approach should be developed first for the new-building construction standards of tankers and bulk carriers. Afterwards, the SLA results should be calibrated with the prescriptive approach (for which we have decades of experience and we know it works), if needed, to produce similar results as our prescriptive experience. Then the SLA approach could be used for other ship types or areas (for which not so much prescriptive experience exists).

8 Focused on the sequence of the work, prescriptive and SLA, one member commented that the new ship construction standards should be developed for bulk carriers and oil tankers by using SLA firstly taking into consideration the results of the prescriptive approach. The results of a comparison of the two different approaches might be helpful to expand SLA.

9 In the context of TOR 1, also the more general item concerning the objective of GBS was raised. It was agreed from the beginning that GBS are 'rules for rules'. However, the comments received indicated that the issue whether these rules are only classification rules or classification rules and IMO regulations requires further discussion.

10 The comments received focused on this part of the discussion are attached in annex 2. In order to achieve a broader participation in the discussion, a questionnaire was used, focused among others on single items raised in the previous discussion. An evaluation of the questionnaire and the comments that were received directly are attached in annex 1. The Bahamas expressed the opinion that this questionnaire was outside the agenda item (comment in annex 1).

Agree on a generic structure for GBS

11 The group confirmed that this item is part of the work to be done. Most of the participants confirmed that the generic structure of GBS should be broad and overarching. Thus, the approach should be developed in a way to make it applicable to all fields (safety and environmental protection) and to cover all ship types and international safety and environmental protection requirements.

12 However, in context with the agreement of the generic structure of GBS, it was noted that a specification of the *generic framework* (structure and definition of components) was required.

Development of general guidelines for rule-making process to follow GBS

13 Nineteen members indicated their support of this item of the work plan. It was mentioned in the discussion that such guidelines should specify the purpose of the goals in rule-making, how to run this process, consider the revision of rules, provide specific explanations in order to result in the same level of safety and presentation, and contain a terminology. The terminology could be developed starting from existing guidelines (MSC/Circ.1022, MSC/Circ.1023 and MSC/Circ.1180) and specific terminology related to GBS should be added. Another comment highlighted that these guidelines should be developed as broad and overarching as possible to provide general guidance and the intention of these guidelines had to be agreed to avoid that these guidelines would become rather a burden than a support. However, in this context it was noted in one comment that these guidelines should not open a way to replace specific requirements and criteria. One member of 21 commented that the definition of clear procedures was important to establish fundamental functional requirements of GBS, when overall target level and target safety levels for individual safety functions would be set up. In another comment it was stated that such guidelines should also consider a process for the revision of rules.

14 The basis for the procedures regarding the development of regulations, rules and standards should be MSC-MEPC.1/Circ. 1, the proposal submitted by the Netherlands in MSC 83/5/6 and MSC 83/INF.2.

15 Two members mentioned that these guidelines should take into consideration the FSA guidelines.

16 However, two members of 21 did not support this work item because in their opinion the guidelines could be tailored to the field they are addressing or because such guidelines could not be developed under the current five-tier structure.

Step-by-step formulation of functional requirements

17 Fifteen members confirmed this work plan item. The expected benefits of this approach highlighted in the discussion were an increased efficiency and a reduction of the required resources. However, some group members noted that, to be effective, this work item should not start before an agreed structure of GBS (framework) and guidelines have been developed.

18 Three members did not support this work item. One of them highlighted that an introduction of functional requirements was too soon because at first a common understanding of SLA was necessary and SLA first had to be made workable and reliable. Another mentioned that this should be started with the same structural matters addressed in the prescriptive approach. Later on, after the effectiveness of the procedure has been proven, other regulations should be

considered. The third member noted that this proceeding was possible for new regulations but to implement it for revisions of existing regulations, a categorization of existing regulations in terms of their functional objectives was required.

Commentary to all new or revised IMO regulations

19 The group confirmed that this work item should be part of the work plan. One member noted that this would be an enormous job. Thus, it is essential that this is done step-by-step, using a simple format, to encourage transparency by providing specific examples and guidelines. It was highlighted that such a revision would be beneficial because it provided an increased transparency and improved efficiency in implementation and maintenance of the requirements. Further, the commentary is needed to enable verification and audits of the rule making process. A problem might be whether IMO be mandated to prescribe this for class rules and other standards. One member proposed that the format specification of the commentary should be part of the guidelines.

Develop procedures for systematic monitoring of casualty statistics and analysis of risks

20 Twenty-one members supported this work plan item. Some members of the group indicated that the development of procedures for systematic monitoring of casualty statistics and analysis of risks for ships and individuals, based on the same identified functional requirements, were important for SLA. One member noted that the monitoring should not be limited to safety but should consider also environmental accidents. The group did not consider who should be responsible for this monitoring. Another member noted that statistical data was just one of many equally important sources for new improved rules.

IDENTIFY AND COMPILE THE ELEMENTS OF THE FRAMEWORK THAT HAVE ALREADY BEEN AGREED TO OR PROPOSED

21 The second TOR was focused on the identification of elements of the framework that had already been agreed to or proposed in previous MSC submissions, working group reports or other IMO instruments (e.g., FSA Guidelines, HEAP process guidelines) and on the identification of existing gaps.

22 In document MSC 83/5/5, some items of a generic framework for GBS were proposed and some group members suggested using them as a basis for the discussion.

Basic principles of IMO GBS

23 The group confirmed that the basic principles of GBS have already been agreed in principle (MSC 80/24, paragraph 6.38) by the Committee as follows: 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.

24 These basic principles provide that GBS is not limited to single ship types and that safety, environmental and security standards should be in the focus of GBS. It was reiterated that GBS should not inhibit innovation.

Structure and elements of GBS framework

25 The discussion centered on the structure and elements of GSB framework related to items 2 and 3 of paragraph 15 of document MSC 83/5/5. Different proposals, focused on the structure of GBS, exist (e.g., MSC 82/5/8, MSC 80/4/4). During the discussion it turned out that different opinions concerning the structure of the GBS exist. One member noted that it has not been settled, or even discussed to any extent, whether the present tier structure, which addresses classification societies rules for new ship construction of bulk carriers and oil tankers, is suitable for all types of regulations which should be covered by the framework. However, there was a common understanding that the generic framework should be an agreed structure under which regulations are to be incorporated in a systematic way.

26 The group discussed the items of the generic GBS framework as proposed in previous submissions (e.g., MSC 82/5/8, MSC 80/4/4):

.1 top-level goal of the IMO regulations, rules and class rules;

.2 sub-goals of the IMO regulations, rules and class rules;

.3 functional requirements that have to be fulfilled to meet the sub-goals and consequently the top-level goal;

.4 verification/validation process for class rules and other standards; and

.5 class rules and other standards.

27 The majority of the group confirmed that the generic framework should contain top level goals of IMO regulations, rules and class rules, sub-goals of IMO regulations, rules and class rules and functional requirements that have to be fulfilled to meet the sub goals and consequently the top level goal. Some members stated that the current Tier I was acceptable. A comment was received that the first three items were “rules for rules” stating high level goals and functional requirements. The discussion here was focused on the generic structure of the framework and thus the possible content was not considered, i.e., the specification of goals.

28 The majority of the group confirmed that the verification/validation process itself was an important part of GBS and should be within IMO’s remit. However, some members advanced the view that the verification/validation process for class rules and other standards does not fit logically in the framework and should be outside of the Tier system. It was identified, that the placement or the verification process, whether it is part of the framework as a Tier or of GBS guidelines, needs further discussion. Albeit the replacement should not lead to a downgrade or reduction of IMO’s control. In this context one member proposed to change the verification/validation process to information/documentation requirements and evaluation criteria. One member highlighted that the clarification of this issue should have a high priority.

Top-level safety objectives and the overall target safety levels

29 The group generally confirmed that the safety objective should consist of a general statement that is further divided into sub-categories. Further, there was a general support for the sub-categories safety of passengers, safety of crew, protection of environment, safety of ship and safety of cargo. Several members noted that occupational [health and] safety is related to [health and] safety of the crew (MSC 83/5/7). The definition of the various categories of people (pilots, surveyors, onshore crew, etc.) needs further discussion, as indicated by one member. Another member highlighted that this discussion did not take into consideration how these levels would be assessed and how possible trade offs between the safety objectives would be regulated. The safety of third parties could be part of the sub-categories but required further discussion.

30 One member mentioned that in this context it should be clarified whether target safety levels for individual safety functions were necessary. Further, this member noted that in paragraph 5.2 of the annex of document MSC 82/5/8 a proposal was provided concerning the scope, the methods and the results of Tier I goals.

The formulation of safety objectives and quantification

31 Safety objectives could be formulated either in general terms or explicitly (hard figures). For both examples several submissions had been provided (e.g., MSC 81/6/14, MSC 72/16). The safety objectives [requirements] should be defined by IMO. Following one member's comment, a huge amount of literature existed on the definition of safety objectives. In document MSC 82/5/8 (paragraph 6, annex) a process concerning the set-up of goals was provided. The scope of this process was the determination of an overall goal of acceptable risk level (safety level) and, if required, the determination of individual risk levels (safety levels) for individual casualty types (sub-categories).

32 A majority of these comments supported a formulation in GBS without hard figures using the ALARP principle for definition, i.e., the safety level of each of the safety objectives should be "as high as reasonably practicable". This means that all cost effective safety measures should be implemented. As mentioned by one member, the application of ALARP principle required a process on how the border limits would be determined (not acceptable and acceptable risk) and, as mentioned by another member, such limits should be discussed and quantified before the application of relevant guidelines. Another member proposed that document MSC 72/16 providing information concerning the definition of these borders and should be used.

33 However, one group member commented that risk should be incorporated explicitly (hard figures) in GBS. These acceptable risk levels should be set referring to the current safety level determined by means of risk models. But it was also mentioned that, at the moment, the data might not be available to clearly define an acceptable level for safety objectives.

34 The definition of tolerable risk levels for systems was regarded as not efficient by one group member. In this context another group member highlighted that a method for establishing safety goals and objectives should be developed.

35 In the discussion it was mentioned that an acceptable risk level (safety level) (and individual risk levels) should be based on the investigation of acceptable risk levels acceptable by public and relevant work conditions, survey of existing risk levels (e.g., MSC 81/6/10, MSC 72/16). One member noted that, before safety objectives could be defined explicitly, it was necessary to determine the current safety level of the present rules to define safety levels that are rational and accepted by the whole maritime community. There is a relation to the issue of

analysis and monitoring of safety. In this context, a member noted that the required data and information to define an acceptable level for all safety objectives may not be available at the moment. Thus, as mentioned by another member, a process should be agreed how risk levels could be determined in these cases. Another group member stated that a determination of the current safety level before safety objectives can be defined is not necessary. This member expressed the opinion that this determination was a huge amount of work that would not bring progress.

36 FSA is the process that helps to determine the current safety level because each FSA contains a quantification of the current risk level but not the safety objectives. Safety goals can be set by top-down process based on what safety level people want.

Monitoring and analysis of safety

37 This item of the discussion relates to item 4 in paragraph 15 of document MSC 83/5/5. As already mentioned in the discussion above, several comments related to the determination of the current safety level or required information. The determination of the current safety level was also a work item of the GBS-SLA correspondence group for MSC 83.

38 The group generally agreed that safety should be monitored to verify whether the current safety level is adequate by collecting and evaluating statistical data. It was mentioned that the monitoring is not an easy task and the resources and format of collected data should be generally agreed. The monitoring and systematic review provides data for the evaluation of existing regulations. It was noted by one member that the current data collected would not allow an immediate use because a continuous collection over a certain time period is necessary, e.g., 5 years. Thus, it was concluded that FSA might not proper monitor the current safety levels but was applicable to analyse safety levels. However, some members noted that statistical data should be only one of many sources. Other sources are in-service experience, accident investigation reports, incidents reporting and risk analysis. One member noted that an agreement of this issue should include the determination of the person responsible for this monitoring.

Main areas under which functional requirements are to be formulated and safety monitored and analysed

39 This item of the discussion relates to item 4 in paragraph 15 of document MSC 83/5/5. The main areas of functional requirements were proposed in various documents submitted previously, e.g., MSC 81/6/8, MSC 81/6/14, MSC 83/5/3 and MSC 83/5/10. It was agreed that overall target safety levels should be broken down to ship functional requirements. The group further discussed the structure of the functional requirements. The majority of the group agreed that, for the time being, the following functional requirements were a "good starting point" that might be amended or revised as required, e.g., according to environmental considerations:

- Manoeuvrability;
- Sea-keeping performance;
- Stability and floatability;
- Emergency control:
  i. Life-saving appliances;
  ii. Fire protection;
- Habitability;
- Power supply;
- Water-tight/weather-tight integrity;

- Navigation;
- Structural integrity;
- Propulsion;
- Communication capability; and
- Cargo handling.

Some members highlighted that this issue was presently not important. However, some members of the group noted that this proposal contained topics that are covered by other IMO conventions and at present the SLA should be focused on new-building construction standards.

Target safety levels for ship safety functions

40 The determination of safety levels for ship functions was discussed briefly. Issues of further discussion could be the process of definition for ship function target safety levels and the relation between different ship functions, i.e., risk balancing.

DEVELOP A PRIORITIZED PLAN TO CLOSE THE GAPS AND PROVIDE A UNIFIED FRAMEWORK THAT ENSURES CONSISTENT DEVELOPMENT OF GBS, I.E., BOTH THE PRESCRIPTIVE AND SAFETY LEVEL APPROACHES

41 The group briefly discussed several items of a long time work plan. These items were:

- Development of GBS guidelines;
- Agreeing on common terminology;
- Development of a procedure for the development of new regulations;
- Development of a procedure for the revision of existing regulations;
- Development of a procedure for the revision of existing regulations;
- Clarification of the linkage between generic GBS framework and class rules and other standards;
- Deciding if overall goal and sub-goals should be ship-type dependent;
- Clarification/definition of monitoring process for safety;
- Introduction of links/relations and cross references for new regulations; and
- Development of a policy document concerning the determination of the safety level.

Development of GBS guidelines

42 The vast majority of the group supported the development of GBS guidelines based on the proposal in document MSC 82/5/8. One member stated that this might support the further defining of the generic structure whereas another member noted that first the generic structure should be agreed upon. However, one member constricted the support of this work item "but except for the methodology should proceed into details".

Agree common terminology

43 Twenty-one members of twenty-two provided comments supporting the development of an agreed terminology, noting that this was already in the TOR of the CG for MSC 83 (MSC 83/5/3). Three members noted that the terminology should be part of the GBS guidelines and should not be a separate task. However, one member highlighted that this item was mainly related to SLA because in the prescriptive approach no terminology problem existed.

Development of a procedure for the development of new regulations

44 This work item was confirmed by 15 of the 22 members. Two members noted that this should be part of the guidelines. Two members highlighted that this procedure already existed with the FSA guidelines. However, three members did not support this work item. One of these members made the comment that it was too soon to start with this work.

Development of a procedure for the revision of existing regulations

45 This work item was confirmed by 17 of the 22 members. Two members noted that this should be part of the guidelines. Two members highlighted that this procedure already exists with the FSA guidelines. However, three members did not support this work item. One of these members made the comment that it was too soon.

Clarification of the linkage between generic GBS framework and class rules and other standards

46 Eighteen members supported this work item. Two members mentioned that national rules should also be taken into consideration. However, one member noted that the linkage should not be between framework and class rules, but from GBS to class rules including all functional requirements and acceptance criteria.

Decide if overall goal and sub-goals should be ship-type dependent

47 In the discussion of this item several members stated that the overall goal should not be ship-type dependent and the sub-goals may be ship-type dependent. However, as stated by one member, ship-type dependency should only be used when absolutely necessary and kept at the lowest possible level.

Clarification/definition of monitoring process for safety

48 The majority of the group confirmed that the monitoring process of safety had to be agreed. Such an agreement should cover the definition of ship types, the reporting format of casualty reports and the way of data collection. One member mentioned that this was a long term task. However, one member referred to previous comments on service structural monitoring (MSC 83/5/12). In document MSC 83/5/12, it was mentioned that structural performance strongly depended on vessel operations, routing, maintenance, etc., and thus this issue should be well thought over before placing this type of requirement in GBS.

Introduce links/relations and cross references for new regulations

49 The majority of the group confirmed that a work item concerning the relation between new regulations and the safety objectives as well as the functional requirements was part of the long term work plan. One member sent the comment that the format should be defined in the GBS guidelines. It was also noted by a member that this should be part of the rule development process. GBS present rules for rules and not the rules themselves. However, one member did not support this work item.

Development of a policy document concerning the determination of the safety level

50 The discussion showed that the majority of the group supported this work item. One comment was received noting that this was already done (safety) or is under development (environment). However, one member did not support this work item.

Additional work items

51 Further, one member proposed to:

- develop reliable databases (both in quantity and quality);
- quantify the impact of the human element (the single most important accident factor);
- develop a proper structural risk model (to link failure of structure to the individual failure modes – determine individual probabilities of failure for each failure mode from which to synthesize total structural probability of failure); and
- determine a current safety level of rules from first principles (not simply by analysing accident statistics).

Condensed work plan

52 Based on the discussion of TOR 2 and the comments received for the work items proposed in the questionnaire, the following items for a work plan are proposed by the group. Concerning these work items, the comments made by the group should be taken into consideration in the further discussion.

.1 Agree the basics of the work plan:

.1 agree the first focus of developing GBS (ship types, functional requirements);

.2 develop a common understanding of GBS-SLA; and

.3 agree whether a balanced approach (oil tankers and bulk carriers study, SLA) or a parallel approach should be used for the development of GBS;

.2 Definition of a generic framework for GBS. This generic structure should be broad and overarching to be applicable to different areas of maritime safety and environmental protection, to cover all ship types, and could be used in the IMO rule making process. The top-level goal[s] should not be ship type dependent. This generic framework contains the top level goals of IMO regulations, rules and classification rules. For the definition of a generic framework the following issues should be taken into consideration:

.1 agree the generic structure concerning tiers and processes and their relation;

.2 agree how the top-level goals [objectives] are set (qualitatively/ quantitatively, implicit/explicit);

.3 agree the formulation and structure of top-level goals (overall goal, sub-categories);

.4 agree whether it would be necessary to define target safety levels for individual ship functions; and

.5 agree top-level goals (overall goal, sub-categories) and criteria for the functional requirements as specified within the previous work item;

.3 Development of general guidelines for GBS. These guidelines should provide an explanation of the purpose of the goals in rule-making. The following items should be included in these guidelines and thus be part of the work plan:

.1 a common terminology taking into consideration other IMO guidelines, e.g., FSA guidelines (MSC 83/INF.2);

.2 a procedure for the development of new regulations (structure, formulation, format: e.g., links/relations and cross references between a regulation and safety objectives, and functional requirements); and

.3 a procedure for revision of existing regulations (structure, formulation, format: e.g., links/relations and cross references between a regulation and safety objectives, and functional requirements);

.4 Agree a process of monitoring of the current safety level. [The risks to be monitored are safety, environment and/or security standards.] The continuous monitoring and analyses of safety would provide the possibility to reconsider goals and acceptance criteria as well as revise functional requirements. Different sources could be used for the determination of the current safety level, e.g., statistical data [(historical)], in service experience, accident investigation, incident reports, etc. Also, risk analysis could be used to find out new types of risk [(pro-active)]. Thus, an agreed process of monitoring should be developed, covering the following items and based on the results already achieved (e.g., MSC 83/5/3, MSC 83/5/7, MSC 83/5/9, MSC 83/5/16, MSC 82/5/1):

.1 agree the risks to be monitored;

.2 agree sources that [could] [should] be used for the monitoring of the current safety level. [(Agree the database)];

.3 agree the kind of statistical data (e.g., casualty reports, incident reports etc), resources of statistical data and format of data collection to be used by Administrations, classification societies, accident investigation boards and other important stakeholders; and

.4 clarify the responsibility for the monitoring of the current safety level;

.5 Agree the determination of the current safety level of rules from first principles based on a developed risk model and the risk model itself;

.6 Agree that all new or revised IMO regulations, class rules and other mandatory standards, should be followed by a commentary in an agreed format, explicitly

stating which functional requirements are addressed, and the substantial basis for the regulation;

.7 Formulate step-by-step functional requirements for all new areas of regulations and for every considered revision of existing regulations. It was mentioned that it might be inefficient to develop functional requirements in one go. The structure and formulation [(format)] should be defined in the guidelines;

.8 Definition of main areas of functional requirements. For the time being, a basis for the functional requirements exists. This list may be revised as required by the results of other work plan steps. Presently, this is not regarded as an important work step.

53 However, concerning item 5 of this list, it was commented that this item need further discussion and clarification.

Prioritization of work plan

54 Although the discussion was limited, the following prioritization was proposed:

.1 agree the basic structure /elements /basics of the work plan;

.2 definition of a generic framework for GBS;

.3 development of general guidelines for GBS;

.4 agree a process of monitoring of the current safety level;

.5 agree the determination of the current safety level of rules from first principles based on a developed risk model and the risk model itself;

.6 agree that all new or revised IMO regulations, class rules and other mandatory standards, should be followed by a commentary in an agreed format, explicitly stating which functional requirements are addressed, and the substantial basis for the regulation; and

.7 formulate step-by-step functional requirements for all new areas of regulation and for every considered revision of existing regulations. It was mentioned that it might be inefficient to develop functional requirements in one go. The structure and formulation [(format)] should be defined in the guidelines.

Action requested of the Committee

55 The Committee is invited to:

.1 note the progress made;

.2 consider the proposed work plan; and

.3 forward the report and related documents envisaged for in-depth review and discussion to the GBS Working Group.

***

ANNEX 1

EVALUATION OF QUESTIONNAIRE

The following countries/NGOs answered to the questionnaire or submitted comments:

BAHAMAS	GREECE	NORWAY
CANADA	IACS	POLAND
CHINA	INDIA	SOUTH AFRICA
DENMARK	JAPAN	SINGAPORE
FAROE ISLANDS	REPUBLIC OF KOREA	SPAIN
FINLAND	MARSHALL ISLANDS	SWEDEN
FRANCE	NETHERLANDS	UNITED STATES
GERMANY		

Work plan to develop a generic GBS framework

Background information:

The following work plan is proposed to develop the generic framework of GBS (MSC 83/5/5) and is supported by some members of the CG:

.1 agree on a generic structure for GBS that can be applied to different areas of maritime safety and environmental protection;

.2 develop general guidelines for rule-making procedures to follow this GBS structure;

.3 formulate step-by-step functional requirements for all new areas of regulation and for every considered revision of existing regulations;

.4 agree that all new or revised IMO regulations, class rules and other mandatory standards, should be followed by a commentary in an agreed format, explicitly stating which functional requirements are addressed, and the substantial basis for the regulation;

.5 develop procedures for systematic monitoring of casualty statistics and analysis of risks for ships and individuals based on the same functional requirements identified above.

Item 1: "agree on a generic structure for GBS that can be applied to different areas of maritime safety and environmental protection"

County/NGO	Yes	No	?	Comments
Canada	X			
China	X			The scope of generic structure for GBS can be set broad and general, but detail researches should be developed for oil tankers and bulk carriers firstly in order to put through SLA.
Denmark	X			
Faroe Islands	X			

Finland	X			
France	X			
Germany	X			Germany understands this as reflecting the MSC decision that GBS should be broad and overarching.
Greece	X			Disclaimer: in line with the view of other delegations, Greece believes that this questionnaire overly expands the TOR of this group and thus is subject to further agreement by the Committee.[1]
IACS	X			To secure the success for GBS as a tool for rule developers, it is considered important that the approach and systematics are developed in such a way as to make it applicable to all fields. This would ensure the efficiency and transparency of the rule development process in general.
India	X			In principle.
Japan	X			Agree on development of generic structure of GBS, which can be used in the IMO rule making process.
Marshall Islands	X			Marshall Islands supports this concept in the context of the agreement at MSC 83 to focus efforts at MSC 84 on the unified GBS framework and SLA and to finalize GBS for bulk carriers and oil tankers including Tier III at MSC 85; and, as the longer term effort to expand the concept beyond structural requirements for tankers and bulk carriers.
Netherlands	X			
Norway	X			We agree that a general framework should be developed. We agree that this should be agreed prior to initiating work on specific applications. We appreciate that the work is long term and that a long term plan is required together with some guidelines and agreed structure of future GBS.
Poland	X			Application of the inductive approach normally reaches a stage, referred to by Norway as "fragmentation that tends to be the result of the current amendment process", that requires rearrangement. This rearrangement can be effected by applying the deductive approach which is a long term process. Therefore, Poland believes that to agree a generic structure for GBS, such a structure should firstly be verified and validated for bulk carriers and tanker structures.
Republic of Korea	X			The generic structure for GBS can be used in all maritime safety and environmental protection (Different areas of maritime safety and environmental protection should be clarified or defined unless it is meant all type of ships and all IMO safety and environmental instruments or areas of functional requirements).
Singapore	X			However, we recognize that it may not be practically possible for a one-size fit all generic structure.
South Africa	X			Flexibility as opposed to rigidity would be preferable so that the scope of application may remain broad. It would then be possible to cover all ship types and international (IMO) safety and environmental protection requirements, and functional requirements.

Spain	X			
Sweden	X			
United States	X			In addition to agreeing on a generic structure, it will also be important to agree on *how* to set up a generic structure, or framework for GBS. For example, some questions that will need to be addressed include: How are top level goals set? What information/data is used to set safety levels? How are safety levels set if there are no existing statistics or data?

[1] In Greece's opinion the scope as spelled out here is way too broad and way too general to be of use in the near future. In fact it is so broad that if each area is to be tackled using Risk Analysis PROPERLY AND CORRECTLY it will take many years perhaps decades. We thus hope that this is simply an effort to lay down some general principles with the intention to tackle and complete properly each area separately in the future. Otherwise one will have to resort to oversimplifications or solutions of the form "whatever our FSA showed". This will be a dangerous path. SOLAS cannot be replaced with FSA, not just yet. There is a long way of serious research to be made ahead before we can start doing that.

The plan as Greece understood it so far is that the SLA approach will be developed first for the new building construction standards of tankers and bulk carriers. Then we will compare the SLA results with our prescriptive approach (for which we have decades of experience and we know it works). Then the SLA results will be calibrated, if needed, to produce similar results as our prescriptive experience. Then the SLA approach could be used for other ship types or areas (for which not so much prescriptive experience exists).

However we seem to see now an attitude of "We are ready to apply SLA to everything NOW". Not only that but by SLA to mean simply a FSA. This is of course not a way forward.

We hope these notions can be further discussed so that a common understanding of what GBS is and where we are going can be achieved soon so that all can contribute to a common goal.

Item 2: "develop general guidelines for rule-making procedures to follow this GBS structure"

County/NGO	**Yes**	**No**	**?**	**Comments**
Canada	X			
China	X			General guidelines for rule revision procedures should also be considered in item 2.
Denmark	X			
Faroe Islands	X			
Finland	X			General guidelines are necessary to explain the purpose of the goals in rule-making. Some areas of safety may need specific explanations in order to result in the same level of safety and presentation.
France		X		Guidelines could be tailored with regard to the area they are addressing.
Germany	X			Guidance on how to run this process is certainly necessary.
Greece	X			But not as a way to replace specific requirements and criteria.

IACS	X			The word "general" is important in this context. Such guidelines should be developed to be as broad and overarching as possible, and to provide general guidance. However, we need to proceed with caution, as once such guidelines are developed for specific technical areas, they are more often a burden than a support. The key question is therefore to be specific on who these guidelines are intended for, and for what purpose.
India		X		I do not think that a general guideline for the Rule-making process can be developed under a 5-Tier pocess of the current GBS Structure. It will need a more sophesticated generic structure / process, e.g., a Tree Structure.
Japan	X			MSC82/5/8 can be used for the development of generic structure for GBS.
Marshall Islands	X			
Netherlands	X			
Norway	X			Required prior to actual development.
Poland	X			
Republic of Korea	X			The general guidelines will be needed for general rule-making prodedures (in view that the FSA guidelines should be used in all IMO rule making , the relation and the extent of using the existing FSA guidelines in developing GBS structures and IMO rule making procedures should be pre-determined).
Singapore	X			However, specifics should not be ignored.
South Africa	X			The general guidelines must however take the FSA guidelines into account.
Spain	X			
Sweden	X			
United States	X			

Item 3: "formulate step by step functional requirements for all new areas of regulation and for every considered revision of existing regulations"

County/NGO	**Yes**	**No**	**?**	**Comments**
Canada	X			It could also be useful to extract goals and functional requirement from existing regulations whenever a revision is considered as a first step in the revision process.
China	X			Step by step procedure for developing GBS structure is general agreed within CG, which was proposed by Sweden (MSC 83/5/5).
Denmark	X			
Faroe Islands	X			
Finland	X			It may be necessary to develop functional requirements also for existing rules – when time allows. It may be non-practicable to make functional requirements only to amendments without considering the area which is to be partly amended.

France	X			
Germany	X			Such a general rule might be subject to special considerations in exceptional cases.
Greece		X		It is way too soon to start messing with established procedures when most do not even have a common understanding of SLA. SLA first has to be made workable and reliable.
IACS	(X)			In our opinion it is much more efficient to develop new functional requirements on an as-need basis instead of attempting to do everything in one go. The other benefit of widening the scope of functional requirements in a step-wise approach is that IMO will have more resources available dedicated to concentrate on the functional requirement at hand. However, this need to be done in a practical way, and it will be important that the level of detail is stopped at a practical level, both to prevent that the classification rules are displaced, and to prevent overly detailed verification criteria.
India		X		This is possible for new regulations; to implement it for revisions to existing regulations, the existing regulations should be categorized in tems of their functinal objective and also formatted first.
Japan	X			
Marshall Islands	X			
Netherlands	X			
Norway	(X?)			When an agreed structure and guidelines have been developed, the work with reformulating existing regulations in the GBS format should start when revisions are considered, and obviously all new regulations should have this new GBS format. In practice thare are activities now developing more goal based standards, but without a guideline. This is not effective.
Poland	X			GBS functional requirements, progress along two parallel tracks - prescriptive and SLA deductive approach. The latter needs further development. Therefore, mutual verification of the methods' results for bulk carriers and tankers is required prior to elaborating functional requirements in other areas.
Republic of Korea	X			It is resonable to choose the step by step approach to identify all new functional requirements (however, a certain pirority for identifying the functional requirements should be given, i.e., establishment of new areas of regulation rather than for revision of existing regulations).
Singapore	X			However, the initial principles have to be agreed upon first.
South Africa	X			A step-by-step approach would allow functional requirements to be properly identified and allow appropriate measures to be put in place.
Spain		X		This should be started with the SLA approach just with the same Structural matters adressed in the prescriptive approach. Later on, once the procedure has proved to be effective it will be the time to undertake the same work with other regulations.

Sweden	X			
United States	(X)			Yes, however it may be too early to consider this item. The GBS framework should be developed first, with an agreed method of how functional requirements are created, before the actual functional requirements are formulated.

Item 4: "agree that all new or revised IMO regulations, class rules and other mandatory standards, should be followed by a commentary in an agreed format, explicitly stating which functional requirements are addressed, and the substantial basis for the regulation"

County/NGO	**Yes**	**No**	**?**	**Comments**
Canada	X			Agreed format shall be part of guidelines (item 2) and is required for consitency.
China	X			
Denmark	X			
Faroe Islands	X			
Finland	X			
France	X			
Germany	X			
Greece	X			
IACS	X			Provided the functional requirements are well drafted, such commentary (or technical background) always provides increased transparency and improved efficiency in implementation and maintenance of the requirements. This is particularly useful when verifying towards safety equivalence.
India	X			
Japan	X			
Marshall Islands	X			While IMO may mandate this for its own regulations, can this be mandated for class rules and other standards?
Netherlands	X			
Norway	X			We still agree. The commentary is needed to enable verification or audits of the rule making process.
Poland	X			
Republic of Korea	X			We agree on the rule commentary, however, it will be a tremendous job when establishing new functional requirements for all areas. A step by step and simple format is recommended.
Singapore	X			To encourage transparency. If necessary, specific examples and guidelines of how the rules or regulations are complied with be included in such commentary.
South Africa	X			This will provide administrations with clear reasoning and solution for national legislation inclusion and owners/managers/inspectors proper guidance.
Spain	X			
Sweden	X			
United States	X			

Item 5: "develop procedures for systematic monitoring of casualty statistics and analysis of risks for ships and individuals based on the same functional requirements identified above"

County/NGO	Yes	No	?	Comments
Canada	X			
China	X			Enviromental protection(risk) should also be included in this procedure.
Denmark	X			
Faroe Islands	X			
Finland	X			Systematic monitoring is important to give early warning of unwanted development. In many cases, the casualty reports need to be studied, because the statistics do not always give adequate information, i.e., the statistics are often too general and they can not be tailored for each casualty.
France	X			
Germany	X			
Greece	X			
IACS	X			Many unknowns associated with this. First of all the data possibly need to be tagged differently than today. Secondly, to ensure consistency in the monitoring an analysis, a body to overlook this activity may need to be established. Third, it need to clear what part of the rule development process such analysis will enter into, it is important to remember that data is just ONE of many equally important sources for new or improved rules. Examples of other triggers for rule development are: individual accidents, new technology, in service experience, risk analysis, expert judgements, research and development, … IACS has already addressed these and other concerns in MSC 83/5/12.
India	X			But not necessarily to develop the GBS framework alone. This is more related to FSA process and will be useful for SLA approach.
Japan	X			
Marshall Islands	X			
Netherlands	X			
Norway	X			Useful information for the evaluation of the functional requirements and the implemented regulations. Good casualty statistics must be long term based, an the data can probably not been used for anything important until we have 10 years of data.
Poland	X			
Republic of Korea	X			
Singapore	X			We are of the view that this is essential in order for safety level approach to be effectively and reliably developed and implemented.
South Africa	X			This will be the best indicator whether provisions are effective or in need of revision.

Spain	X			
Sweden	X			
United States	X			These procedures should include who is responsible for this monitoring.

Structure of the generic framework

Background information

Following the previous discussion of the CG, the generic framework of GBS should consist of:

.a top-level goal of the IMO regulations, rules and class rules;
.b sub-goals of the IMO regulations, rules and class rules;
.c functional requirements that have to be fulfilled to meet the sub-goals and consequently the top level goal;
.d verification/validation process for class rules and other standards;
.e class rules and other standards.

County/NGO	Yes	No	?	Comments
Canada	X			We do not necessarily see item d. as a step in the framework limited to class rules and other standards, but more as a general review process for the completed regulation. As noted in MSC 83/5 the verification of compliance may also lead to adjustment in the goals or the functional requirements.
China	(X)			Yes, but a little amendment should be made. I agree the proposal of MSC 82/5/8 by Japan, verification/validation should be put outside of tier system. Since Japan's proposal is described as to be favored by most of the CG participants in circular summary R1, Tier d should be revised. The verification process should be put outside of Tier system and be summarized as supporting document. Tier d should be changed to information/documentation requirements and evaluation criteria, which are listed as draft guidelines for the verification of compliance with GBS Part B.
Denmark	X			
Faroe Islands	X			
Finland	X			Yes, but the bais should be on the Swedish proposal. National rules (if differing from the international convention) should be added in d and e. However, the Swedish proposal (MSC 83/5/5) giving five steps (.1 – .5) should be the basis, and the above points a-e could give additional information to points .2 and .3 of the Swedish proposal.
France	X			
Germany	X			I understand that this reflects the work of the last years and the experience gained so far.
Greece	X			Yes, provided tier d is within IMO's remit.
IACS	X			To a large extent we agree to the generic framework, except for item d. We agree that we need some sort of verification process, but in the framework, this item does not "fit"

				logically. Without item d., the flow of gradually more comprehensive and specific requirements provides a logical framework for rules, regulations and other standards. However, IACS is of the opinion that some sort of verification is to be required, and that the verification process itself should be part of a GBS Guideline.
India		X		Class rules and other standards should be excluded from the GBS structure. It should only be used to examine class rules and other standards.
Japan	X			However (d) "verification/validation process for class rules and other standards" is the outside the tier system, but within the total framework of GBS.
Marshall Islands	X			Marshall Islands emphasizes that "d", which reflects current Tier III, is a vital and fundamental aspect of GBS.
Netherlands	X			We agree with items but this is not the complete picture. The indicated items are important elements of the generic framework of GBS. Next to that procedures are necessary, possibly in the form of guidelines, on how to incorporate new rules in the framework. The procedures, the above mentioned items, rules are parts of the generic structure which we have to describe first. Possibly starting with writing the guidelines could be of help for doing that.
Norway		X		As stated previously, we think d. (and other process issues) should not be part of the goal based regulations. In current regulations (e.g., SOLAS) this is also mixed (each chapter its own style). GBS should contribute to a more consistent framework. Top level goals (a) should be solved by cross referencing to FSA Guidelines.
Poland	X			However, instead of item "d" item "e" (which becomes "d") could read "verified class rules and other standards". Verification should be left in the hands of IMO.
Republic of Korea	X			In sub-paragraph e, national regulations are to be included. National regulations, class rules and other standards. We consider that any national regulation that may differ from the international conventions should come under IMO GBS.
Singapore	X			"verification/validation process for class rules and other standards", which is Tier III, is an integral and essential part of GBS and cannot be excluded from the generic framework.
South Africa	X			National rules should be included. However if the national rule is less stringent than international rules, then the international rule should prevail outside of the national waters.
Spain	X			
Sweden		X		All items listed are important parts of a goal-based regulation and we support them as such. However, we see the generic framework rather as an agreed structure under which regulations are to be incorporated in a systematic way. Therefore processes, rules and standards are more to be seen as the future content of that framework than the framework

				itself. We think it is of advantage to settle the framework first and then fill it with its content. As a starting point Sweden therefore have proposed (MSC 83/5/5) that the structure could consist of the following items: .1 the basic principles of IMO GBS; .2 a general Tier structure in which regulations, rules and standards are to be incorporated; .3 top-level safety objectives; .4 main areas under which functional requirements are to be formulated and safety monitored and analysed; and .5 instructions for the Committee and sub-committees on how this structure is to be followed in the rule-making process.
United States	X			As indicated in the comments for item 1 of the work plan, it will be important to agree on *how* to set up a generic structure, or framework for GBS. While we agree that the items listed above are a part of GBS, primary consideration needs to be given to the items identified in MSC 83/5/5, paragraph 15, including the basic principles of IMO GBS and instructions on how this structure is to be followed.

Top-level safety objectives

Background information: Following the previous discussion of the CG the safety objectives should consist of a general statement that is further divided into six categories:

a. safety of passengers;
b. safety of crew;
c. safety of third parties (occupational);
d. protection (safety) of environmental;
e. safety of ship;
f. safety of cargo.

County/NGO	Yes	No	?	Comments
Canada	X			
China	(X)			Yes, but category 3 needs to be discussed. Safety of third parties is not directly relevant to ship construction standards. And the safety level of it is not demonstrated in several presented examples. Therefore category 3 needs to be discussed whether it is proper to be categorized.
Denmark	X			However, as indicated in the Danish submission concerning the occupational health and safety issue, the occupational health is related to the safety of crew and NOT to safety of third parties.
Faroe Islands	X			Occupational should relate at least to the crew or both crew and third parties.
Finland	X			The contents of the points may need some discussion. Category c should also cover the property in addition to

				"occupational" and "occupational" should be also for the crew in category b. Perhaps "occupational" should be its own category to cover all who work in the ships (i.e., crew, surveyors, pilots, stevedore workers, etc.), similarly as the environment protection (cat d). Also the wording "safety of" could be in all categories "protection of" or "safety and protection of". Today SOLAS protects the life (in the beginning of articles: promoting safety of life at sea) and Load Lines protect the life and property (safeguarding life and property at sea).
France	X			
Germany	X			
Greece	X			
IACS	X			The proposal is logical and follows the approach taken in the FSA methodology, it will have to be considered what is meant by the various categories of people: examples are pilots, surveyors, on shore crew, terminal workers, etc. In our opinion, the most suitable body for discussing the practicalities is the FSA WG. Care will also need to be made to ensure consistency with the scope of IMO regulations in general.
India	X			However, how will these levels be assessed? Individually or on a common platform? Also how will various stakeholders during the ship's life be considered for the design and construction o a new ship? How will trade-offs between the safety objectives be assessed?
Japan	X			
Marshall Islands	X			Yes, but see comment. Marshall Islands sees this as an SLA element.
Netherlands	X			We agree that occupational should be part of b.
Norway	X			We believe that occupational health and safety for crew should be part of category b, in line with the proposal from Denmark.
Poland	X			
Republic of Korea	X			Paragraph c and d should be clarified more about its application. I wonder if should include security concept, safety of port or other land facilities,
Singapore	X			Of the view that security, ease of maintenance, operation is considered an integral part of safety, and construction can and should include the above elements in mind.
South Africa	X			We believe that the ranking of the categories as they are above is correct whether the layout is coincidental or not.
Spain	X			
Sweden	X			Sweden agrees with Denmark that the occupational health and safety should be part of b. safety of crew, and not of c. safety of third parties. We would also like to see c. as the last one which better reflect the priority and amount of present IMO regulations.
United States	X			

Quantification of top-level safety objectives

Background information: One issue discussed in the CG is the quantification of the top-level safety objectives. Safety objectives can be formulated either in general terms or explicitly (hard figures). For both examples are provided by several submissions (MSC 81/6/14, MSC 72/16). In MSC 82/5/8 a process concerning the set-up of goals is provided. The scope of this process is the determination of an overall goal of acceptable risk level (safety level) and if required the determination of individual risk levels (safety levels) for individual casualty types. Acceptable risk level (safety level) (and individual risk levels) should be based on the investigation of acceptable risk levels acceptable by public and relevant work conditions, survey of existing risk levels (before safety objectives can be defined explicitly it is necessary to determine the current safety level.) and application of the ALARP principle. FSA and HEAP are the processes that help to determine the current safety level because each FSA contains a quantification of the current safety level (step 2).

Proposal: The safety level of each of these safety objectives should be as high as reasonably practicable. The process how this level is determined is described in the FSA guidelines.

County/NGO	Yes	No	?	Comments
Canada	X			The process is described in the FSA guidelines, however there is not necessarily enough data or knowledge to clearly define the acceptable level for all safety objectives at the moment. Monitoring, data collection and analysis need further development.
China	X			The limit of ALARP principle should be determined according to different safety objectives. It should be discussed and quantified before the application of relevant guidelines. Since it is a hard task, one PT organized by IMO is suggested to be established for further development.
Denmark	X			
Faroe Islands	X			
Finland		X		Of course the safety level should be as high as practicable, however the rules should give the minimum safety level by using ALARP. Also the information of MSC 72/16 should be used.
France		X		Overall risks should be ALARP.
Germany	X			
Greece		X		FSA guidelines alone cannot complete this goal. One of the first steps needed is to determine the current safety level of rules.
IACS		X		The overall objective should be that overall risks should be tolerable and ALARP. Splitting this up into individual systems is not efficient, as this will always have to be balanced against each other and not specific safety levels can be set. We also disagree that we need to determine the current safety level before safety objectives can be defined. This is at best a moving target, and we cannot see either how this can be done or what value it would have. Our concern is to use huge amount of resources on a task that would not

				bring us forward. In our opinion the tolerable safety levels should be the same for shipping as for other industry sectors, and the objective should be that rules and regulations should aim for a continuous improvement of safety at sea by developing, maintaining and implementing cost efficient risk reducing measures.
India		X		Current FSA processes have inherent difficulties in addressing the ALARP for the safety objectives indicated above.
Japan	X	X		For the first sentence, YES. However, we do not think FSA guidelines provide how to establish safety goals. FSA will identify weak point(s), but not show the way to establish safety goal. Safety goal can be set by top-down process. In other words, safety level can be set by determining to what level of safety people want. This is not shown in FSA. Therefore, we shall develop the method for establishing safety goal and objectives.
Marshall Islands	X			Definition or explanation of "reasonably practical"?
Netherlands	X			This means that safety measures which are cost-effective should be implemented. The ALARP principle is explained in the FSA guidelines, but the process on how to determine the levels (the borderlines in the graphs for distinction between acceptable, the ALARP region and not acceptable) is not.
Norway	X			We agree. The only short term development needed relates to environmental risk. Long term we will just have to maintain the FSA Guidelines. FSA does not determine the safety objectives. The rationale of defining safety objectives is, e.g., briefly described in MSC 72/16, but there is a huge literature on this.
Poland	X			Poland is of the opinion that the safety level approach assumes that goals take the form of safety objectives with set risk, defined by probability of failure or fatality (hard figures), with the objective achieved when each ship function satisfies the set risk level. These acceptable risk levels can be set by referring to the current safety level, determined by the risk model. The risk models for bulk carriers and tanker structures need to be developed, agreed and verified/ validated using, *inter alia*, the statistical data.
Republic of Korea	X			However, the FSA guidelines may be re-developed to more properly evaluate the safety level of each safety objectives.
Singapore	X			Can agree that safety level, if it can be reliably and consistently quantified, should be as high as reasonably practicable. However, usage of source of data may vary, especially when there are uncertainties, lack of information, and eventually human judgmental assessment have to come in for risk/safety level.
South Africa	X			The FSA guidelines may have to be revised to accommodate the level of the above safety objectives.

Spain		X		The concept of "reasonably" is too vague. FSA method might not be the only valid approach to determine the actual safety level. Furthermore different safety levels must be used to each topic or against each possible failure depending on the severity of the possible consequences and social impact.
Sweden	X			The ALARP principle is supported and preferred compared to hard figures. Besides that it is not clear how the FSA guidelines describe the process of determining the safety level.
United States	X			Yes, but when dealing with safety levels, the output is only as good as the input. In other words, for some requirements, there may not be adequate input to determine safety levels. There should be some agreement on a process to be used if existing risk levels can not be determined.

Analysis and monitoring of safety

Proposal: Safety should be monitored to verify whether the current safety level is adequate. Monitoring and analysis should be performed by collecting and evaluating statistical data.

County/NGO	**Yes**	**No**	**?**	**Comments**
Canada	X			
China	X			The time window of statistical data should be determined, which was not generally agreed at MSC 83. Additionally, classification of accidental data, resources of statistical data and format of collected data should be generally defined and agreed.
Denmark	X			The safety level could also be determined by the use of FSA.
Faroe Islands	X			Statistical data need to be collected in a common database to provide equal reference when evaluating.
Finland	X			Additionally risk analysis should be used, e.g., to find out "new type" of risks.
France	X			In addition, areas where risk reducing measures could be available should be investigated.
Germany	X			
Greece	X			
IACS	X			The reason for monitoring would not be to adjust the safety level, but to identify areas were cost effective risk reducing measures can be found, and to trigger development of new rules within these areas. Statistical data will be one of many sources for this type of input to the rule developers; other sources are in service experience, accident investigation reports, incident reporting, technological development, research and development and so forth. IACS is concerned that a too heavy reliance on statistical data will prove futile. It can ALLWAYS be argued that data is inadequate, and thereby that the safety level is inadequate or too strict. By implementing the ALARP principle, we get around this, and ensure that the most up to date information from all available sources are used in a systematic way when

				developing new requirements. Se also other remarks on this issue made in MSC 83/5/12.
India	X			
Japan	X			Not just by data. Sometime careful analysis would be required to investigate the data and to derive current safety level. Monitoring the current safety level is not an easy task.
Marshall Islands	X			Again, a fundamental SLA element but note Pilot Panel recommendation on "continuous performance monitoring".
Netherlands	X			Collecting statistical data may not be the only thing to be done. In the FSA's expert opinions play an important role especially when statistical data is lacking. If possible information on (small) incidents should also be collected.
Norway	X			Obviously historic data should be collected and reviewed systematically to benchmark and follow-up the effect of existing regulations, but we also need to use risk modelling and expert elicitation techniques for a more proactive approach.
Poland	X			
Republic of Korea	X			The safety level may be changed according to the monitoring results.
Singapore	X			However, it is envisaged that such monitoring and reporting efforts would be very onerous, and have potential for errors and misreading.
South Africa	X			As per item 5. This will be the best indicator whether provisions are effective or in need of revision.
Spain	X			
Sweden	X			Monitoring based on statistical data is important for benchmarking and follow-up of the effect of existing regulations, but analysis and risk modelling should be used as well for a more proactive approach.
United States	X			These procedures should include who is responsible for this monitoring.

Main areas under which functional requirements are to be formulated

Background information: The main areas of functional requirements are discussed in several submissions: MSC 81/6/8, Figure 1; MSC 81/6/14, annex (Tier 2); and MSC 83/5/10, paragraph 18.

Proposal: for the time being the main areas of functional requirements are as follows:

- Manoeuvrability
- Sea-keeping performance
- Stability and floatability
- Emergency control:
  i. Life-saving appliances
  ii. Fire protection
- Habitability
- Power supply
- Watertight/weathertight integrity

- Navigation
- Structural integrity
- Propulsion
- Communication capability
- Cargo handling

County/NGO	Yes	No	?	Comments
Canada	X			Agree on the main topics. Reordering of the list may be considered, closely related items could follow each others (e.g., Watertight/weathertight integrity – Structural integrity, Power supply – propulsion ...).
China	X			Evacuation should be considered in functional requirement of emergency control, which is same important to ensure safety of crew and passengers as life-saving appliance and fire protection.
Denmark	X			We agree on the proposed, however the proposed elements do only reflect the "safety of the ship" issue.
Faroe Islands	X			Shall not be limited to the "safety of the ship" issue – believe this need further clarification.
Finland	X			Good starting point. Maybe some areas could be combined (e.g., navigation covers manoeuvrability and sea-keeping).
France				TO DATE, NO DEFINITE IDEA
Germany	X			
Greece		X		Not at present. At present SLA should be developed for new building construction standards in order to be tested and calibrated.
IACS			Maybe	It does not really matter as long as the selected main functions are comprehensive enough to accommodate the risks we want to address. Recent experience has shown us that the emerging risks of main concern are primarily related to system safety and ship system failures (both due to incorrect operation and failure of individual components within complex systems), as long as the functional areas encourage efficient control of relevant types of risk we are fine with it.
India	X			Only for the establishment of the functional objective in Tier II. Additionally, evacuation and rescue should be included under emergency control. Manoeuvrability should also be supplemented with 'course keeping ability'.
Japan		X		Components of functional requirements will be determined in accordance with goals. Therefore, it is difficult to answer at this stage.
Marshall Islands	X			
Netherlands	X			We see this as the starting point and it clearly needs further development.

Norway	X			In practice we suppose we will make the instruments goal based chapter by chapter, based on needs. The nice thing with GBS is that it will be easy to restructure functional requirements later.
Poland	X			
Republic of Korea	X			However, the main areas of the proposed functional requirements may be changed according to more clarified goals.
Singapore	X			
South Africa	X			It is understood that the functional requirements as above are not complete and may be amended or revised from time-to-time as goals change or are added to.
Spain		X		The proposal contains topics which are covered by other IMO conventions which so far should not be addressed according to the present work program. Expanding this coverage would require a specific debate and acceptance by the Council.
Sweden	X			This is a reasonable starting point but may need to be adjusted for areas where there is a strong correlation. Watertight/ weathertight integrity and floatability should be treated as one area.
United States	X			We assume that this is not a prioritized list. Recommend adding environmental considerations to this list.

TOR 3: develop a prioritized plan to close the gaps and provide a unified framework that ensures consistent development of GBS, i.e., both the prescriptive and safety-level approaches

The task of this TOR is to identify the items of a long-term work plan to ensure consistent development of GBS and to prioritize the items.

Items of long-term work plan: Concerning the results of the discussion for TOR 2, I would like to suggest for the long-term work plan the following items:

.1 Development of GBS guidelines (proposal MSC 82/5/5, corrected to MSC 82/5/8)

County/NGO	**Yes**	**No**	**?**	**Comments**
Canada	X			
China	X			
Denmark	X			
Faroe Islands	X			
Finland	X			
France	X			
Germany	X			
Greece	X			Yes but except for the “methodology” should proceed into the details.
IACS	X			

India	X			
Japan	X			
Marshall Islands	X			
Netherlands	X			Yes, and as proposed earlier this could be of help for further defining the generic structure.
Norway	X			
Poland	X			
Republic of Korea	X			
Singapore	X			
South Africa	X			
Spain	X			
Sweden	X			Yes (but first the generic framework need to be agreed).
United States		X		No – it is unclear how MSC 82/5/5 relates to development of GBS guidelines

.2 Agree on common terminology

County/NGO	**Yes**	**No**	**?**	**Comments**
Canada	X			
China	X			
Denmark	X			
Faroe Islands	X			
Finland	X			
France	X			
Germany	X			
Greece	X			
IACS	X			
India	X			
Japan	X			
Marshall Islands	X			
Netherlands	X			Yes (= part of the guidelines).
Norway	X			Yes, not a separate task.
Poland	X			Comment to item 2: There is a need to define fundamental terms used with reference to GBS. For example such terms as: - ship safety standard (level of safety defined by...) - ship function (in our understanding ship function means the purpose for which a ship is designed, built and operated) - functional requirement (?), etc., should be agreed (in the form as, e.g., in MSC 80/6/6) based on English semantics.
Republic of Korea	X			
Singapore	X			
South Africa	X			
Spain	X			Yes, but it must be recognized that while this is imperative in the SLA in order to build-up a useful data base of casualties to

				establish the actual safety levels, in the prescriptive approach there is no terminology problem mainly because there is no uncertainty or ambiguity on the topics addressed by each requirement.
Sweden	X			Yes (as part of guidelines).
United States	X			

.3 Development of a procedure for development of new regulations (structure, formulation)

County/NGO	**Yes**	**No**	**?**	**Comments**
Canada	X			
China	X			
Denmark	X			
Faroe Islands	X			
Finland	X			
France				WHAT ABOUT FSA?
Germany	X			
Greece		X		No, too soon.
IACS				We already have this. It is called FSA.
India		X		
Japan	X			
Marshall Islands	X			
Netherlands	X			Yes (= part of the guidelines).
Norway	X			
Poland			X	
Republic of Korea	X			
Singapore	X			
South Africa	X			
Spain		X		
Sweden	X			Yes (as part of guidelines).
United States	X			

.4 Development of a procedure for review of existing regulations (structure, formulation)

County/NGO	**Yes**	**No**	**?**	**Comments**
Canada	X			
China	X			
Denmark	X			
Faroe Islands	X			
Finland	X			
France	X			
Germany	X			
Greece				No, too soon.
IACS				?. Not sure what is meant by this: “review” in relation to what?

India		X		
Japan	X			
Marshall Islands	X			
Netherlands	X			Yes (= part of the guidelines).
Norway	X			
Poland	X			
Republic of Korea	X			
Singapore	X			
South Africa	X			
Spain		X		
Sweden	X			Yes (as part of guidelines).
United States	X			

.5 Clarification of linkage between generic GBS framework and class rules and other standards (ISO)

County/NGO	**Yes**	**No**	**?**	**Comments**
Canada	X			
China	X			
Denmark	X			
Faroe Islands	X			
Finland	X			Yes, this should cover also the national rules.
France	X			
Germany	X			
Greece				Do not understand the question. The linkage should be not just from the GBS "framework" to class rules but from the GBS itself to class rules (including all its functional requirements and acceptance criteria).
IACS				We do not consider this to be unclear, but in case it is, we support to make this clarification.
India	X			
Japan	X			
Marshall Islands	X			
Netherlands	X			
Norway	X			
Poland	X			
Republic of Korea	X			Yes, however, I see no reason why only ISO should be meant as other standards.
Singapore	X			
South Africa	X			yes. However please see our comment under 'Structure of the Generic Framework' above. National rules should be included. However if the national rule is less stringent than international rules, then the international rule should prevail outside of the national waters.

Spain	X			
Sweden	X			Yes (as part of the framework)
United States	X			

.6 Decide if overall goal and sub-goals should be ship type dependent

County/NGO	**Yes**	**No**	**?**	**Comments**
Canada	X			Yes – If possible ship type dependency should only be used when absolutely necessary and kept at the lowest possible level (e.g., sub-goals).
China	X			
Denmark	X			
Faroe Islands	X			Sub-goals, yes. Overall Goal?
Finland				Overall goals should not be ship type dependent. The sub-goals may be – but not necessarily.
France				TO DATE, NO CLEAR IDEA
Germany	X			
Greece				Ideally not type dependent.
IACS		X		No, improvement of safety at sea should not be ship type dependant. However, some ship types will have unique capabilities that may require individual sub-goals, but overall safety and environmental protection goals should – provided they are forulated in a rational way – not be ship type dependent.
India	X			
Japan		X		No. It is not always necessarily by ship type dependent. This approach can be done in the later stage, such as SOLAS chapter II-2 and III. First thing to do is set-up over-all goal and functional requirements. Then, if necessary, functional requirements for each ship type may be developed.
Marshall Islands				Not necessarily.
Netherlands	X			Yes, there will be some sub-goals that are only appicable to certain ship types.
Norway		X		No the overall goals should not be ship type dependant and yes the sub-goals may be ship type/cargo type dependent as needed. A main point is that the ship type definitions should be more functional (e.g., cargo type is often more important for risk than ship size).
Poland				Not necessarily.
Republic of Korea	X			Yes. However, the sub goals should be ship type dependent but the overall goal should be common to all type of ships.
Singapore	X			
South Africa	X			
Spain				Not necesarily in principle, but this should be decided upon development of the actual specific GBS.

Sweden	X			Yes (at this stage we are in favour of not having overall goals ship type dependent while sub-goals may need to be ship type dependent for some areas).
United States	X			

.7 Clarification/definition of monitoring process for safety (overall, safety objectives) (agree on ship types agree on a commonly accepted reporting format and collect data for establishing the safety level)

County/NGO	**Yes**	**No**	**?**	**Comments**
Canada	X			
China	X			
Denmark	X			
Faroe Islands	X			
Finland	X			
France	X			
Germany	X			
Greece	X			
IACS				Sort of, but see IACS concerns raised in MSC 83/5/12.
India	X			
Japan	X			
Marshall Islands	X			
Netherlands	X			Yes, but first the structure has to be defined.
Norway	X			Yes – long term.
Poland	X			
Republic of Korea	X			
Singapore	X			
South Africa	X			
Spain	X			
Sweden	X			
United States	X			

.8 Introduce links/relations and cross references for new regulations between safety objectives, between functional requirements and to the main areas of functional requirements (MSC 83/5/6 "to detect the aim of the regulations and the reasons why the specific regulations have been put into place")

County/NGO	**Yes**	**No**	**?**	**Comments**
Canada	X			Yes – format should be part of the guidelines.
China	X			
Denmark	X			
Faroe Islands	X			
Finland	X			
France	X			
Germany	X			

Greece	X			
IACS				We of course support to have this in place, but it is part of the rule development process to create a link from the rules to the functional requirements, and not for the GBS process to provide this relationships. We should continue to treat GBS as rules for the rules and not the rules themselves. We would therefore support to have a requirement in GBS stating that new rules/requirements should be linked to the GBS framework.
India		X		
Japan	X			
Marshall Islands	X			
Netherlands	X			
Norway	X			
Poland	X			
Republic of Korea	X			
Singapore	X			
South Africa	X			
Spain	X			
Sweden	X			
United States	X			

.10 Development of a policy document concerning the determination of the safety level (overall, safety objectives)

County/NGO	**Yes**	**No**	**?**	**Comments**
Canada	X			
China				Do not understand this question. What is concerned in suggested policy document? Criteria of safety level, process of evaluation or something else? It should be clarified.
Denmark	X			
Faroe Islands	X			
Finland	X			
France	X			
Germany	X			--
Greece	X			
IACS				Hard to disagree, but I guess we already have this in place through MSC 72/16.
India		X		
Japan	X			
Marshall Islands	X			
Netherlands	X			
Norway	X			Yes. Done (safety) or in progress (environment).
Poland	X			

Republic of Korea	X			
Singapore	X			
South Africa	X			
Spain	X			
Sweden	X			
United States	X			

Additions:

Greece:

In Greece's opinion the below issues should be part of long term work plan to make SLA reliably workable (Note: some topics borrowed from Annex of MSC 81/6/3 (Japan) – Report by International Ship and Offshore Structure Congress):

10. Develop reliable database (both in quantity and quality)
11. Quantify impact of Human Element (the single most important accident factor)
12. Develop proper structural risk model (to link failure of structure to the individual failure modes – determine individual probabilities of failure for each failure mode from which to synthesize total structural probability of failure)
13. Determine current safety level of rules from first principles (not simply by analysing accident statistics)

India:

Assessment of the implementation issues under GBS.

Prioritization of the proposed items:

(Please indicate your prioritization by arranging the numbers of the items separated by commas beginning with the highest priority. Consider only supported items. Example: 5, 7, 1, 2, 3, 10,…)

County/NGO	**Comments**
Canada	2 to 5 and 8 should all be part of the guidelines and be developed in parallel, publication of 1 being the final result. 6 should be decided when a regulation is created or revised (although it should be addressed in general terms in the guidelines).
China	2, 6, 1, 5, 8, 7, 4, 3
Denmark	1, 4, 3, 8, others
Faroe Islands	1, 4, 3, 8, 2, others
Finland	--
France	--
Germany	2, 6, 1, 3, 4, 8, 7
Greece	13, 12, 10, 11
IACS	--
India	--

Japan	Because each items should be examined in parallel, there is no meaning in prioritization.
Marshall Islands	1, 2, 3, 5, 4, others
Netherlands	--
Norway	1, 4, 3
Poland	--
Republic of Korea	Almost all works should be done in parallel, however, we prefer, 6, 5, 2, 1, 3, 4, 7, 8, 9
Singapore	No preference on prioritization. All are necessary and equal in importance. However, 4 should be placed as topmost in our view. For 7, perhaps a feasility study on the practicality should be determined first.
South Africa	We believe that all the items should be dealt with in parallel as the one impacts on the other. If we HAVE to choose then the order in which they appear above is logical, i.e., 1, 2, 3, 4, 5, 6, 7, 8, 9.
Spain	2, 7, 1, 5, 8, others
Sweden	--
United States	--

Comments on Questionnaire

BAHAMAS

I find it extraordinary that the questionnaire ignores virtually all of the points raised in the previous Bahamian note. In particular, there is no indication that the origin of this exercise was to develop a methodology whereby the IMO can monitor the standards being set by classification societies. This remains the main focus of the GBS activity and can not be brushed aside in the way you are proposing. In this regard the Tier III verification process is an integral part of the process.

You note that there have been comments from only five countries (out of a huge group) yet you state that there has been strong support for certain proposals. This seems to assume that the silence means agreement with the views of the few. However, it would appear that 20% of the response was from the Bahamas and yet this seems to carry no weight.

I would also remind everyone that the title of the agenda item under which the current work is being carried out is "Goal-based new ship construction standards". What is currently being outlined in the questionnaire is way outside this remit and requires approval of the Committee as a new work item – or even several work items – with the usual full justification. It is not for a Correspondence Group to expand on a work programme item approved by the Committee.

I will not attempt to answer your questionnaire as I do not consider it relevant to the work which we are supposed to be doing. Any response to the one sided questions being asked will only give the impression that the basic concept of the document is approved, it most certainly is not.

INDIA

However, prior to going through my response I would like you to note the following arguments.

.1 GBS initiative in my opinion is a strategic issue at IMO and can be interpreted in 2 ways.

Option 1: It can be strategized as the 'Rule of Rules' for the various international statutory instruments including IMO conventions and codes, classification rules and standards. In this case, it becomes a compliance standard requiring the verification process as an integral aspect of GBS (in fact, the GBS then ends at Tier III).

Option 2: It can also be interpreted as the methodology for the development of goal/performance based regulations/codes/rules, etc., either in prescriptive or risk-based format. In this avatar, the verification process does not become an integral part of GBS structure, as it will have to be carried out externally through a verification/audit process.

Either of the above interpretation in my opinion is valid, provided we choose one to follow. As far as I remember, the original submissions on GBS was primarily aimed at addressing the Option 1 (compliance objective), although subsequent submissions from many administrations apparently interpreted GBS as Option 2.

.2 It will be difficult to develop GBS as a full-fledged methodology at the MSC sessions for all IMO/classification regulations. It then runs the risk of being unwieldy for many conventional vessels, especially in SLA format, and also suffers the possibility of being compromised at IMO level due to non technical pressures. Strategically, therefore, this Option 2 will not be a good choice, as it will make design and development of many conventional commercial vessels expensive and time consuming (however, for a passenger cruise ship, LNG carrier or FPSO, such efforts may be quite admissible).

.3 I therefore, have provided my comments with the objective of interpreting GBS under Option 1. The onerous task of developing a generic methodology for goal-based regulations at functional level should be left to the classification societies and individual sub-committees under MSC, MEPC, etc.

MARSHALL ISLANDS

Marshall Islands has completed the questionnaire in the context of the agreement at MSC 83 to focus efforts at MSC 84 on the unified GBS framework and SLA and to finalize GBS for bulk carriers and oil tankers including Tier III at MSC 85.

SPAIN

2. Comment (2008-01-02): I would like to refer to my previous mail of 21 December 2007, wherein I expressed the general ideas of the delegation of Spain regarding the steps to be taken on the GBS development, and in particular on the SLA approach. On this token I am enclosing herewith the questionnaire sent with your message of 19 December duly filled and collecting these ideas.

Thirdly I wish also to state that the delegation of Spain fully supports the comments made by the Greek delegation in its mail dated 28 November 2007, on the summary of the answers to TORs 1 and 2 attached to your mail of 27 November.

1. Comment (2007-12-21): First of all I wish to express that I am in agreement with has been said by Captain Bell. Indeed, I am particularly concerned with the possibility that the main purpose of the GBS stated originally, which in fact was to insure that the Rules under which the vessels are to be designed and built are robust and able to guarantee the achievement of the basic goals of safety, might be diluted. The GBS must be developed as a clear and precise set of requirements suitable for an objective verification of their compliance and not open to every subjective judgement.

This tendency to dilution seems to be also the idea behind the movement to throw the original Tier III, Verification Process, out of the five tiers scheme. To consider this important step just as a QA item of each particular class society is to return to the previous status when IMO had nothing to say regarding those items covered by class. Of course class societies have their own responsibility over the Rules they develop, but the verification has to be performed by an independent body and not by their internal QA departments, just the same as when any company wants to be certified for compliance with an ISO standard.

Another important topic is that of the reliability which the SL Approach may have versus the prescriptive approach under the actual state of the art. It has been repeatedly mentioned by many contributions to MSC sessions that there is an important lack of organized data on vessels' casualties, that they are not uniformly classified, and indeed, that those attributed to structural failures are badly described. These facts lead to the situation that it is not possible at this time to relate the consequences with the real primary cause and therefore, the actual safety levels are presently impossible to be objectively established.

On the contrary, by applying the latest developments into the prescriptive approach, each known type of failure is directly related with the operational and environmental actions, including their probabilistic treatment, and therefore the safety factors may be clearly stated. Based on this it is not acceptable that this approach be stopped waiting for the development of the SLA until reaching a similar level of confidence.

It is also noted that the scope of the SLA is intended to be expanded to include subjects which are presently covered by specific IMO Conventions and are therefore, in my understanding, beyond the original purpose of the GBS. The idea of developing a set of GBS covering everything related to the vessels' safety in a logical and coordinated way is all right, but definitely is not actually what is normally understood as a "step by step" approach.

In summary I want to say that SLA is a promising tool for the future, after a proper data base is built and fully analysed. In the meantime all the efforts to provide a framework into which the findings will be fitted are welcome. The ideas proposed by Sweden (MSC 83/5/5) and Netherlands (MSC 83/5/6) are quite correct, but let us apply them to what we have presently without trying to incorporate new topics, because either we will delay the GBS towards the far future or we will develop just very general and vague standards not useful to ensure the enhancement of the vessels' safety. I feel that once we have checked that this framework works properly for what we have presently under development, then it will be very easy to expand the coverage to other regulations.

SINGAPORE

Singapore's opinion is that the safety-level approach and the prescriptive approach are complementary of each other. Where the safety level approach can be used reliably and consistently (e.g., damage stability), it could be used. Where there are uncertainties and lack of data, the more conservative prescriptive approach may be more appropriate.

***

ANNEX 2

COMMENTS OF THE GROUP

BAHAMAS:

1 The few submissions so far have only mentioned the SLA approach to GBS. It is very important that the prescriptive' approach is not ignored. The work to be done must include the ways in which this approach will be developed beyond the present exercise. This should include at least:

.1 further ship types; and

.2 other safety areas to be covered by a GBS approach.

2 TOR 1

If we are to develop a generic structure for GBS, it is important that we do not throw out all that has been so carefully developed in the work on tankers and bulk carriers. The 6 points made in your note are solely directed to the SLA approach and there is no point of convergence with the "prescriptive" approach. If the group is to fulfil its mandate then this must be addressed. If amalgamation proves to be impossible then we must acknowledge the fact and revert to a parallel method of dealing with the two systems rather than sweeping the differences under the carpet and calling a single method approach "generic".

Your note mentions that the "generic" approach is to develop general guidelines for IMO rule making. This ignores the basic intention of the GBS approach which was to give administrations, through IMO, a means of verifying the standards being set by classification societies. So we would fundamentally disagree with your statement. The point of the exercise to date and the agreement reached so far both in the MSC Working Group and in the MSC plenary is that this an exercise directed towards giving IMO a method of ensuring that the rules developed by class meet some commonly agreed international standards. I can quote the Secretary General's address to the Assembly when outlining his view of the Organization during his forthcoming term of four years:

> "the safety of life at sea should continue to remain the IMO's principal objective and, in this respect, work to further progress the 'goal-based standard' concept will continue, in anticipation of the beneficial impact it will certainly have, among other things on the overseeing of the performance of recognized organizations."

Clearly, the Secretary-General has a similar view of GBS to our own.

The path which you are proposing is the one already developed through the FSA methodology. We do not need to reinvent that particular wheel.

The purpose of the present approach is not to develop guidelines for IMO rule making. It has been agreed throughout the exercise that we are developing "rules for rules", in other words, we are developing a means to check that rules meet agreed standards. If the SLA approach is to develop this approach then the safety levels agreed should be ones against which rules can be assessed and not try to reproduce what has already been tried and tested for a number of years through the FSA exercise.

It is very important that the purpose of GBS be established at the outset of this Group's work.

3 TOR 2

The key to the success of GBS is to have a verification methodology capable of ensuring that rules, usually class rules, meet the agreed international standards. It is an integral part of the tier structure and should remain within it if the system is to be credible. We would strongly oppose separating the verification process from the tier structure.

All of the remaining work under this TOR seems to be directed solely to the SLA approach, this is a distortion of the instructions received from the Committee. A balanced approach should be adopted or the former parallel approach adopted and the formally recognized.

GREECE:

1 We believe that the generic structure of GBS proposed by Sweden in paragraph 15 of MSC 83/5/5 consisting of five items can serve (be used) as a minimum for the current exercise and can be further expanded, especially items 2 to 4, to cover the two points raised by Captain Bell.

In some ways the Japanese proposals in MSC 82/5/8 are similar and we agree with Japan's points 1 and 2 in their reply to TOR 1.

But we should repeat the view that Greece has put forth in several prior submissions (regarding the risk based approach): to reliably set either overall safety levels (Tier I goals) or individual failure mode safety levels (Tier II, e.g., from buckling/fatigue/accidents, etc.), two things must be done:

.1 The current rules safety level must be determined (if we don't know what the safety level of current rules/ships is how can we set an "improved" future desired safety level?)

.2 A risk model must be developed that links the top/overall safety level to the individual failure modes safety levels all the way down to the scantlings of the ship.

With regard to verification, we believe that the verification process is very important for the implementation of GBS and should remain within the tier structure, the way it has been agreed and worked up to now at IMO and agreed by the Panel of Experts for bulk carriers and tankers and has been included in Tier III. Therefore, we strongly believe that it should also stay in the generic structure of GBS.

2 Greece's positions are substantially similar in many issues with Sweden's MSC 83/5/5. If one limits itself to the "methodology" to be followed, there is almost complete agreement. When, however, going deeper into details of the process, Greece urges caution. FSA is not risk analysis (it encompasses risk analysis), thus unless the gaps of ship risk analysis are solved, FSA in itself (as MSC 82/5/8 seems to heavily rely on) will not provide all the answers especially for ship structures.

As far as the most major element which has been agreed so far, we consider this to be the existing 5 tier system.

We would not agree to place Tier III (verification) outside IMO's tiers nor to rename it to "justification" nor to limit it to a class "self audit" as MSC 82/5/8 suggests. We should be reminded of some of the original intentions that IMO decided to proceed with GBS. One of these is to have more involvement in the ships design and structural rules.

As far as comments on the framework we would kindly request the group's consideration of the following paragraphs from Greece's previous submissions: MSC 80/6/5, paragraphs 3 to 11; MSC 81/6/16, paragraphs 7, 12, 13 and 15; MSC 81/18/2, paragraphs 3 to 5.

As far as gaps and weaknesses are concerned please see following: MSC 81/6/16, paragraphs 7 to 9; MSC 81/18/2, paragraphs 7 to 10 and 16.

JAPAN:

We would like to send you Japanese comments on TORs 1 and 2 of the CG of GBS as follows.

1 TOR 1

Clarify the work to be done to develop a generic GBS framework based on documents MSC 83/5/5, MSC 82/5/8 and other related documents.

Japan thinks there would be three points to be discussed, such as

(1) to make clear the view on how to decide the overall target safety level,

(2) to make clear the view about whether it would be necessary to prepare target safety levels for individual safety functions, i.e., each safety elements including collision avoidances, precaution of groundings and fire safety, etc. in addition to overall target safety level or not, and to make clear the view on how to decide the target safety levels for individual safety functions when they necessary, and

(3) to make clear the view whether we put verification process outside of the tier system of generic GBS structure or inside.

(1) In terms of making clear the view on how to decide the Overall Target Safety Level,

Japan's view: We should agree on scope of ALARP of individual risk, such as Limit of Intolerable Risk and Limit of Negligible Risk, described in MSC 72/16 (Norway).

Reference: Please find the paragraph 5.2 (Set-up a goal) of the annex of MSC 82/5/8 in the attached file.

(2) In terms of making clear the view about whether it would be necessary to prepare Target Safety Levels for individual safety functions, i.e., each safety elements including collision avoidances, precaution of groundings and fire safety, etc., in addition to Overall Target Safety Level or not, and to make clear the view on how to decide the Target Safety Levels for individual safety functions when they necessary, and

Japan's view: For GBS structure, we should decide both Overall Target Level and Target Safety Levels for individual safety functions. When we would decide Target Safety Levels for individual safety functions, we can use GBS in early to verify relevant safety systems which would deviate from detailed regulations, for example, evacuation system for large persons.

Reference: Please find the paragraph 5.2 (Set-up a goal) of the annex of MSC 82/5/8 in the attached file.

(3) to make clear the view whether we put verification process outside of the tier system of generic GBS structure or inside.

Japan's view: Process is not a rule, but verification of the rule. Therefore, we should put the verification process outside of the tier system of generic GBS structure.

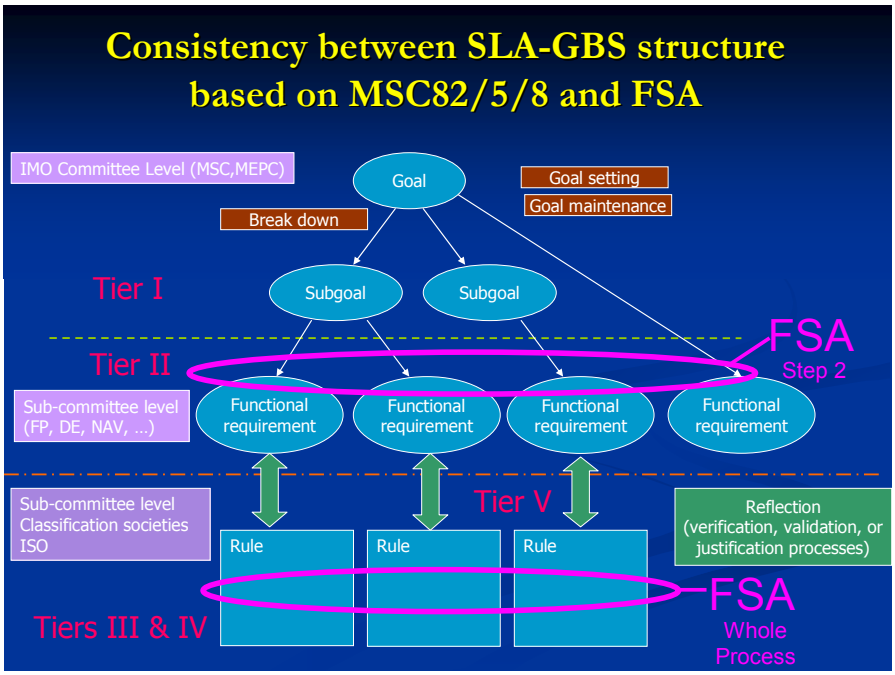
Reference: Please find the paragraph 9 (Evaluation and verification of compliance) of the annex of MSC 82/5/8 in the attached file.

2 TOR 2

Identify and compile the elements of the framework that have already been agreed to or proposed in previous MSC submissions, working group reports or other IMO instruments (e.g., FSA Guidelines, Heap process guidelines) and identify the existing gaps;

Japan thinks the discussion point is **to make clear procedures to establish fundamental functional requirements of GBS, when Overall Target Level and Target Safety Levels for individual safety functions would be set up**.

Japan's view: We should establish procedures to obtain fundamental functional requirements of ship systems by collecting relevant information about system elements, safety means and risk levels, etc., when rule makings with harmonized way of FSA and HEAP and to put such functional requirements into GBS structure and to identify GAPs. This means to make clear how to use risk models in GBS.



Please refer the below figure about FSA. As for HEAP, HEAP is implementation of a checklist on considerations of human factors, so that it is not related with GAPs.

Reference: Please find the paragraph 6 (Fundamental functional requirements, Tier II) of the annex of MSC 82/5/8 in the attached file.

Conclusion:

As concluding of Japan's views described comments above TORs 1 and 2, we think it appropriate that we would establish GBS structure based on GBS Guidelines, MSC 82/5/8, which would include additional detailed descriptions about procedures into referred parts above.

NETHERLANDS:

We only have a very short comment with respect to the first TOR. That is that our opinion is that the work to be done is perfectly described in MSC 83/5/5 from Sweden in paragraphs 14 to 20. Actually we have nothing to add to that.

With the help of TOR 2 we could indicate on what topics we already have information and on what topics information is missing. If we include this in the work plan as proposed by Sweden we might be able to put the work plan in a timeframe, which then might be input for TOR 3.

NORWAY:

TOR 1: Norway's views has been stated many times, going back to MSC 79 (MSC 79/6/15). Some points are:

Norway sees GBS development as much needed reform of the IMO regulatory process, a view that we had also when IMO introduced FSA (witch we think had similar objectives). The most important aspect is related to rationality, systematics and transparency. More concretely, we think IMO regulations have to become more goal oriented and formal safety based to avoid the continuous fragmentation that tend to be the result of the current amendment processes. If regulations are developed considering specific technology it should go without saying that the frequency of amendments will be high if the technology develops fast (as now).

When we emphasize the role of safety level (risk based) approaches, this is simply based on the observation that IMO's role is to define safety standards and to regulate risks (safety, security, environment) and that formal methods should be used whenever possible. It is also an attempt to remind members that a lot of relevant work has been done in this area earlier and this should be used. Therefore, Norway has provided many references to other literature in previous submissions.

Relating to the Tier structure, we agree with the many delegates and the few submissions stating that the current Tier I is acceptable, but a cross reference to the ALARP principle and the FSA Guidelines is needed. This was indicated in MSC 79/6/15. If the case is reopened, we will contribute with what we think is a better wording. The proposal is applicable to rules and regulations for all ship types and functions.

Relating to Tier II (for structures/construction) we find the proposals in MSC 82/5/5 most relevant. The terminology is consistent with the standard terminology described briefly in MSC 80/6/6. These proposals are applicable to rules for all ship types (but not other functions).

Tier I and Tier II are 'rules for rules', stating high level goals and functional requirements. For innovative designs, where existing rules and regulations (that are prescriptive and based on a specific previously developed technology) do not apply, a safety level approval should be possible based on Tier I and II. A guideline for safety level approval would be needed in this case (e.g., similar to the current situation for fire protection, SOLAS regulation II-2/17, but general). (SAFEDOR tends to the expression risk based approval, but stating a risk level may be observed as planning for a number of incidents/accidents).

Relating to other functions, the work to be done is considerable and may take many years. This is where we think a long term plan is needed. Our main point is that new regulations should be developed following a functional (goal based/safety level) approach rather than a prescriptive. Before major work is initiated, we need the GBS Guidelines, and a long-term plan. When this initial work is completed, the possibility to follow the existing approach should be closed.

We agree with those indicating that Tier III – Verification of Compliance, does not belong in the GBS structure. The current Tier III may be an IMO internal QA guideline for the verification or audit process.

Tier III (previous Tier IV) are rules and regulations for ship design, construction and operation. They are not necessarily much different from current classification rules or IMO regulations. However, the rationale of the rules should be justified in a rule commentary (to be in agreement with Tier I and II). The verification or audit is directed at verifying this justification (like the FSA verification of regulations). The commentary is not part of the tiered structure.

Comment: The rules and regulations in Tier III may be prescriptive. When we say that the rules and regulations should also be safety level based, this comes from the justification (FSA in general or Structural Reliability Analysis for structures).

Tier IV (current Tier V) are specific technical standards that enter the regulations by reference. These standards will be prescriptive in most cases.

TOR 2: We have identified the main documents above. Relating to specific previous documents, MSC 81/6/14 contains relevant ideas, but we are of the opinion that too many numerical values for tolerable and negligible risks should be avoided. As already indicated in MSC 72/16, the criteria necessary relates to individual and societal risk (crew, passengers, and third parties) and the marine environment. Economic losses are covered by the economic analysis (NPV). MSC 81/INF.6 is a good demonstration that other criteria are obsolete. Many FSAs have demonstrated the same.

We agree with everyone indicating that terminology is important and should be developed as we develop GBS. However, we should observe that professionals have a much standardized terminology already. We must therefore avoid confusion by introducing terminology that is not in harmony with terminology used by professionals in the various fields.

As indicated above, the GBS – Safety Level Approach is much simpler and faster to implement for IMO than the GBS for Tanker and Bulk carriers. This is a result of being enabled to formulate goals at a high level and following a principal approach.

SWEDEN:

TOR 1: Reference to MSC 83/5/5

Swedish views on the work to be done to develop a generic GBS framework is in general covered by our submission MSC 83/5/5. This was a first proposal that we of course are prepared to modify to account for other views expressed by members of the correspondence group. For the sake of clarity we would like to reiterate some basic points made in that submission.

We believe that GBS may form the urgently needed rational and systematic framework for future development of technical regulations, rules and standards, that will enable the proactive policy already decided. We also believe that this framework should and could address several of the problems we are facing today with an ever increasing regulation complexity leading to sub-optimization and lack of transparency (paragraph 10).

In the same way as the IMO goal-based standards themselves should be independent of ship design and technology, it should be possible to start working according to a generic framework that is long-standing but still open for development of the methodologies used. A framework that directly could incorporate building blocks like the present work on GBS for bulk carriers and oil tankers and other ongoing regulatory developments, risk-based as well as prescriptive. (paragraph 13).

In response to the comments made by the Bahamas 2007-11-15, we thus consider that this framework should not be restricted to encompass any specific "approach". The main purpose of the framework is to introduce goal based systematics in IMO rule-making in general.

Our proposal for a step by step introduction of GBS is presented in paragraph 14 of MSC 83/5/5. In the following we will comment a little more on the first two steps which are decisive for the others, and try to identify gaps that need to be filled (TOR 2).

A generic structure for GBS that can be applied to different areas of maritime safety and environmental protection

MSC 83/5/5, paragraph 15, lists possible items that could be included in this structure.

1.1 The basic principles of IMO GBS

Agreed or proposed elements:

MSC 80/24, paragraph 6.38, the Committee agreed, in principle, to the following text for the basic principles. 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.

Gaps identified:

No.

Discussion:

These principles are still valid and should guide the further development of GBS.

1.2 The Tier structure

Agreed or proposed elements:

The proposed tier structure for goal-based new ship construction standards for bulk carriers and oil tankers, figure from MSC 81/6/1, annex 2:

Status:

The proposed Code "International Goal-Based Ship Construction Standards for Bulk Carriers and Oil Tankers", MSC 83/5/2, annex 2, does only regulate Tier I-III and IMO requirements are not addressed at all so far. It has further been discussed that there may be a lower Tier V which could include local shipyard standards, etc.

Germany has, in submitting MSC 81/6/14, proposed a slightly modified structure including Tier 0 as the IMO mission statement (figures below are only partial extracts from the annex to MSC 81/6/14).

Japan has, in submitting MSC 82/5/8, proposed a tier structure where the justification is seen as a process and not included as a separate tier (partial extract from MSC 82/5/8, annex):

Gaps identified:

It has not been settled, or even discussed to any extent, whether the present tier structure which addresses classification societies rules for new ship construction of bulk carriers and oil tankers is suitable for all types of regulation which should be covered by the framework.

Discussion:

For the sake of consistent terminology, Sweden tends to prefer the Japanese proposed structure where the different tiers all address what is to be followed by the object of the regulation while we see the verification as part of the QA system among rule-makers. We think this structure is suitable to incorporate also IMO rules where the verification process may differ significantly compared to the verification of rules developed outside of IMO.

1.3 Top-level safety objectives

Agreed or proposed elements:

Several high-level documents address the objectives of the organization, its committees and sub-committees. However, top-level safety objectives for the object of regulations are not set out explicitly. IMO mission statement is the closest we have to safety objectives, "the mission of the International Maritime Organization (IMO) is to promote safe, secure, environmentally friendly and sustainable shipping".

Different submissions have proposed to target the objectives to (six) different areas which then are broken down to different areas of functional requirements in accordance with the figure from MSC 81/6/8.

An example of how these objectives may be quantified is given in MSC 81/6/14. An example of a more general formulation of objectives, without quantification, can be found in the proposed SOLAS amendments II-1/3-[10] for structures of bulk carriers and oil tankers, MSC 83/5/2.

Gaps identified:

There is need to agree on the division of objectives, on their formulation and to what extent they should be explicitly quantified.

Discussion:

Sweden supports that top-level objectives are divided on the six areas as proposed by Germany, Denmark and others. We also support that the general ALARP principle is to be applied. However, at this stage, we do not find it absolutely necessary to put in hard figures on the top safety level. We think the application of the ALARP principles in rule-making should be included in the GBS guidelines (see 2.3 below).

1.4 Main areas under which functional requirements are to be formulated

Agreed or proposed elements:

Fragments of this has been proposed in various submissions, e.g., MSC 81/6/8 and MSC 81/6/14 (see the extracts above) as well as in CG-SLA reports MSC 82/5/1, annex 1, and MSC 83/5/3, annex 4. SOLAS and MARPOL divisions and traditional sub-committee divisions are also components to account for. Nothing substantial is agreed.

Gaps identified:

There is need to develop and agree on the division into main areas for functional requirements.

Discussion:

As proposed in comments to this correspondence group by Greece and in many previous submissions, risk models should be the rational basis for breaking down safety goals into functional requirements. However, there will always be significant elements of interaction

between the areas and therefore the model chosen need not be perfect as long as it is used consistently and the interaction is accounted for.

1.5 Instructions to the Committee and sub-committees on how this structure is to be followed in the rule-making process

Agreed or proposed elements:

-

Gaps identified:

Guiding documents such as resolutions A.900(21), A.970(24) and A.971(24) as well as MSC-MEPC.1/Circ.1 may need to be revised to fully reflect a goal-based framework for rule-making.

Discussion:

It would be an useful exercise to go through these instructions, plans and guidelines and look at the changes needed. In our view the changes may not be very extensive.

1 Develop general guidelines for rule-making procedures to follow this GBS structure

MSC 83/5/5, paragraph 16, lists possible items that could be included in the guidelines:

2.1 terminology;
2.2 procedures for identifying hazards and formulating functional requirements;
2.3 procedures for the development of regulations, rules and standards including quality assurance, justification and documentation;
2.4 verification and approval procedures.

MSC 82/5/8 (Japan) includes "... a possible outline and framework of the guidelines for GBS, which would serve as a basic for development of the guidelines".

2.1-2 Terminology, procedures for identifying hazards and formulating functional requirements

Agreed or proposed elements:

Existing guidelines MSC/Circ.1022, MSC/Circ.1023 and MSC/Circ.1180 include already most of the needed terminology and procedures.

Gaps identified:

Specific terminology and procedures related to the IMO GBS structure need to be added.

Discussion:

-

2.3 Procedures for the development of regulations, rules and standards including quality assurance, justification and documentation

Agreed or proposed elements:

IMO procedures are included in MSC-MEPC.1/Circ.1. A proposal for documentation requirements has been submitted by the Netherlands in MSC 83/5/6.

Gaps identified:

IMO procedures need to be revised to reflect the IMO GBS structure. New procedures need to be developed for other parties who develop rules and standards with the purpose of fulfilling IMO goals and functional requirements.

Discussion:

-

2.4 Verification and approval procedures

Agreed or proposed elements:

A verification process for class rules has been developed by the GBS Pilot Project in MSC 83/5/1.

Gaps identified:

The developed verification process is only intended for class rules. It should be considered where verification and approval procedures are needed also for other cases, e.g., for 1st principle approval by Administrations of novel ship designs.

Discussion:

The procedures for verification and approval need to be balanced with the procedures for quality assurance, justification and documentation. Guidance on first principle verification and approval may be taken from the new Naval Ship Code which has been developed according to a goal-based framework.

_____