

GBS Presentation from JAPAN

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- GBS Development in IMO**
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GBS Development in IMO

IMO work plan of GBS

- The biannual IMO Assembly, at its 23rd session, adopted the Strategic plan for the Organisation during the six-year period (2004 through 2010) and, inter alia, resolved that "the IMO would establish *goal based standards for the design and construction of new ships*" (resolution A.944(23)).
- This decision was reflected also in resolution A.943(23) on the long-term work plan of the Organisation, up to 2010, where an item on "*Goal-based new ship construction standards*" was introduced under the list of general subjects.

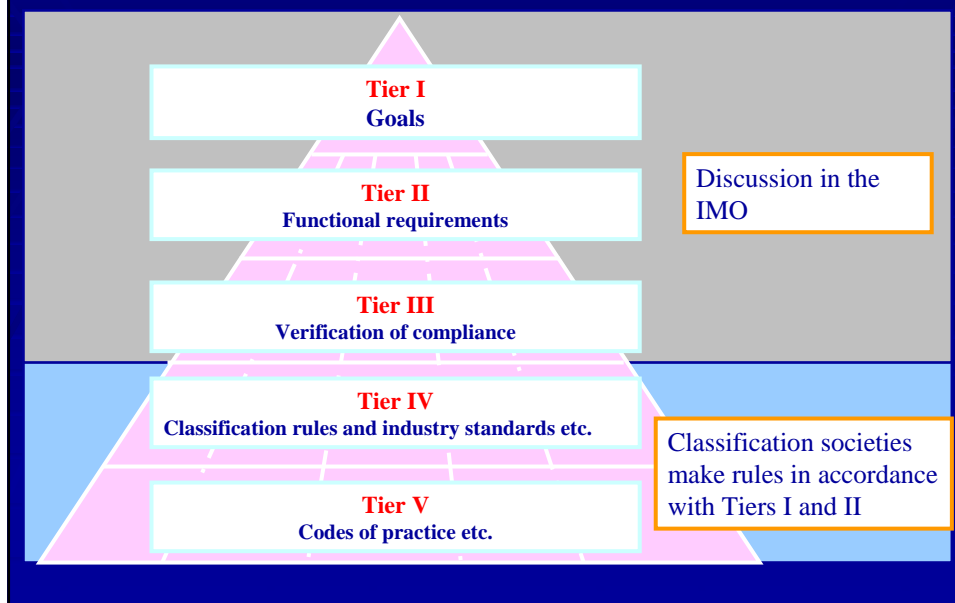
Prescriptive Approach

VS.

Safety Level Approach

MSC81 agreed to work on the **prescriptive approach** and the **safety level approach** in parallel, namely to continue with the **development of GBS for bulk carriers and oil tankers**, based on the work done so far on the subject, with a view to finalisation at MSC 83; and also to work on **GBS based on the safety level approach**.

GBS Five-Tier system



Safety Level Approach

Safety Level Approach provides :

- **quantitative assessment** for safety level (risk level) to be attained
- **optimum rules** or **rule making process** taking into account safety issues, environmental issues and economical issues so that excessive requirement would be excluded
- **relative assessment** among different rules
- **pro-active approach** rather than re-active approach

Provisional Long-Term Work Plan for the SLA

1. **Determination** of the **current safety level** in a holistic high-level manner for individual ship types in order **to develop Tier I goals**
2. **Consideration** of the outcome from **MSC's work on FSA** for use in the development of the SLA, in particular concerning **risk acceptance criteria**, and including **existing FSA studies**,.
3. **Consideration** of the **tier structure** so far agreed in **GBS for oil tankers and bulk carriers** for use in the SLA.
4. **Examination** and **broadening** of the **Tier II functional requirements** as developed **for oil tankers and bulk carriers** to other issues for use in the SLA

Provisional Long-Term Work Plan for the SLA (cont.)

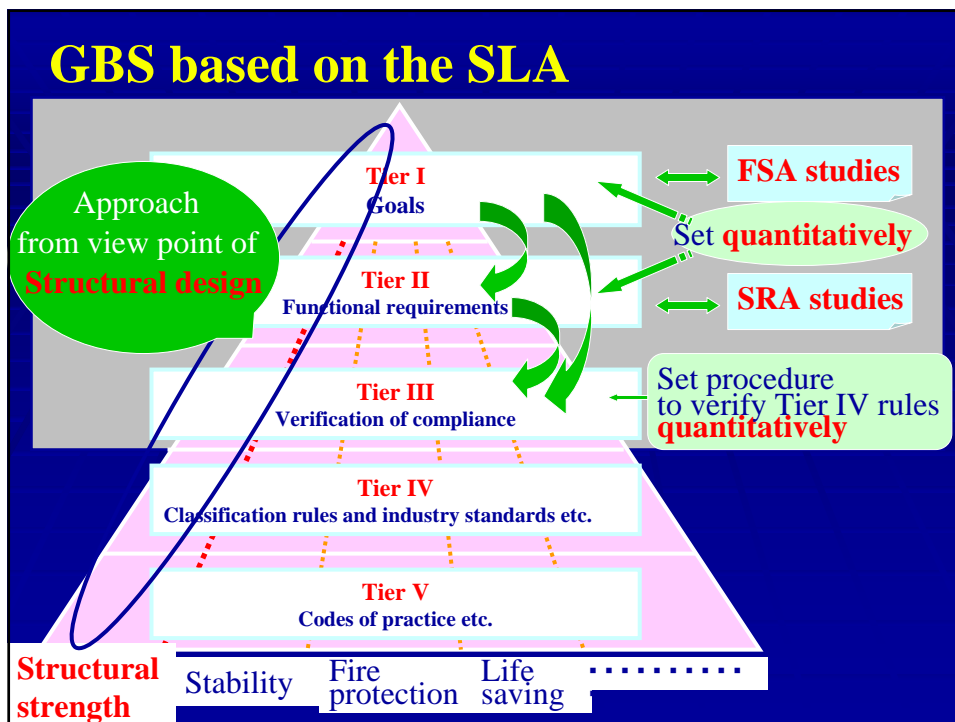
5. **Examination** of **risk models** to consider the contribution from different design measures, e.g., structural strength, stability, manoeuvrability, fire protection, *etc.*, and from human element as well as organisational structures.
6. **Development** of **goal-based standard guidelines** for the SLA.
7. **Consideration** of the **Tier III verification process**.

Terms of Reference for the SLA-CG

1. **To progress works** to determine the **current safety level** in a holistic high-level manner for **individual ship types** in order **to develop Tier I goals** by:
 - .1 **Distinguishing ship types** in a clear manner resulting in definitions of generic ship types for the purpose of statistical analysis;
 - .2 **Determining time windows** to be used for historical data when establishing statistics for **risk categories**;
 - .3 **Reviewing available statistical data** in accordance with 1.1 and 1.2, taking into consideration also the **results of previous FSA studies** as applicable;

Terms of Reference for the SLA-CG (cont.)

2. To consider the **linkage between FSA and GBS**, identifying which elements are relevant for both, and in particular, consider **risk acceptance criteria** based on **MSC's work on FSA**;
3. To consider the **tier structure** so far agreed for GBS for **oil tankers and bulk carriers** for use in the SLA.
4. To progress the development of **goal-based standard guidelines** for the SLA.

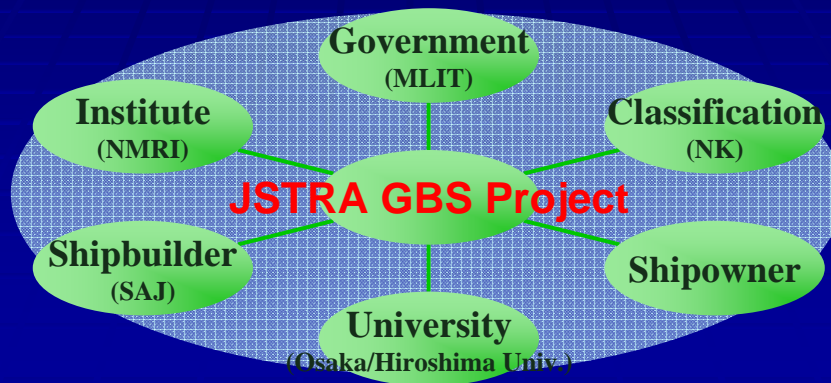


JSTRA GBS Project

Japan Ship Technology Research Association

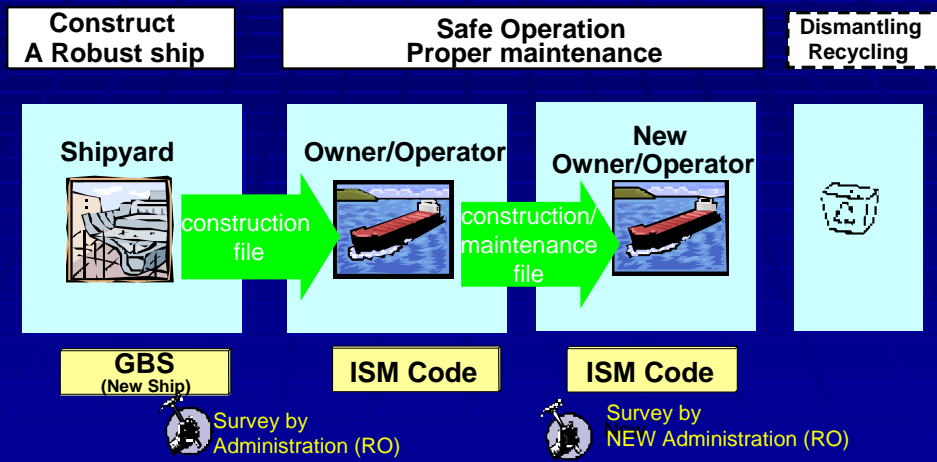
Platform for coordination

Experts and stakeholders gather together and conduct/coordinate research and development with an aim to contribute to the achievement of IMO GBS.



Basic principle of the Project (cont.)

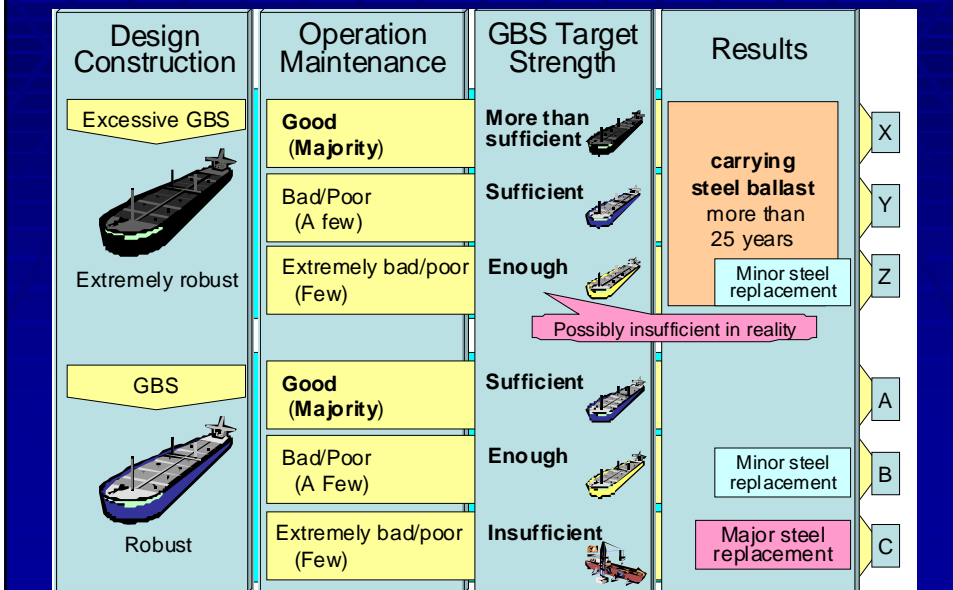
Life-cycle of ship



Sufficient strength should be secured throughout the life of a ship by all stakeholders

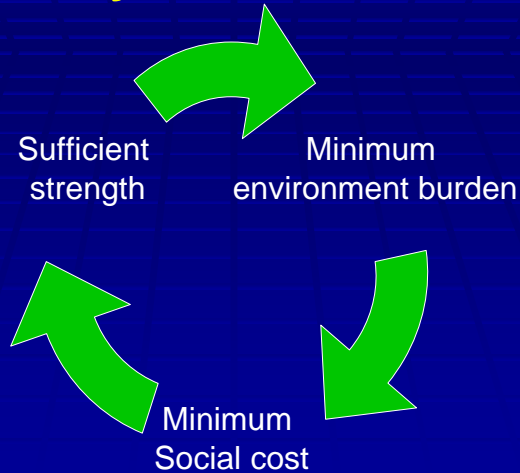
Basic principle of the Project (cont.)

Which option should GBS pursue?



Basic principle of the Project (cont.)

Three **key** elements for GBS



**Optimum should be attained
for sustainable development**

General Activities of the Project

Period: 2005-2009 (5 years)

- To watch international movements and collect information
- To evaluate benefit by enhancing safety and environment protection
- To estimate impact of GBS on the industry
- To develop theories, methods, tools and rules
- To collaborate with international activities
- To develop practical and rational proposals to the IMO

Main TOR of the Project

1. GBS in Prescriptive approach for bulker/tanker

- To estimate impact of GBS on the industry
- To develop practical GBS scheme
- To make out proposals to IMO on the basis of the results

2. GBS in Safety level approach (SLA)

- To investigate SLA in different fields
- To develop probabilistic safety level methodology, in particular, for ship structures
- To evaluate current safety level of ships
- To consider and establish practical and appropriate target safety level for ships
- To consider how to incorporate SLA in GBS
- To develop GBS guidelines on the basis of SLA
- To make out proposals to IMO on the basis of the results

Associated Research Subjects

- Structural Reliability Assessment (SRA): at NMRI
- Probabilistic Model of Ultimate Hull Girder Strength: at Osaka Univ. and Hiroshima Univ.
- Risk modelling: at NMRI
- Cost benefit analysis: at NK
- ...