Maritime Regulation and Action from Industry

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I. IMO Regulation Overview
IMO Framework

ASSEMBLY

COUNCIL

- Legal Committee
- Technical Co-operation Committee
- Maritime Safety Committee
- Marine Environment Protection Committee
- Facilitation Committee

- DE
- FP
- DSC
- NAV
- COMSAR
- SLF
- STW

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MSC Focus on Maritime Safety

**SHIPPING**

- **Piracy and armed robbery against ships**
- **Role of the human element**
- **Formal safety assessment**

Guidance for preventing and suppressing piracy and armed robbery against ships

Joint IMO/WHO working group on areas of common interest. The implementation of the guidelines concerning fair treatment of seafarers

**FSA Guidelines**
Tier II Functional requirements

1) Design life (25 years)
2) Environment conditions
3) Structural strength
4) Fatigue life
5) Residual strength
6) Protection against corrosion
7) Structural redundancy
8) Watertight and weathertight integrity
9) Human element consideration
10) Design transparency
11) Construction quality procedures
12) Survey
13) Maintenance
14) Structural accessibility
15) Recycling

Goal-based new ship construction Standards

Develop appropriate measures to enhance the safety of general cargo ships.

Formal safety assessment study on general cargo ships.
MEPC Focus on Maritime Environment Protection

**SHIPBUILDING**

- Recycling of ships
- Green House Gas Emission Reduction
- Harmful anti-fouling systems for ships

the design, construction, operation and preparation of ships so as to facilitate safe and environmentally sound recycling

EEDI, EEOI, SEMP, MBI

Coatings, Sea chest gratings, Sacrificial anodes, Bio-fouling management plan, Bio-fouling record book
MEPC Focus on Maritime Environment Protection

Harmful aquatic organisms in ballast water

To prevent, minimize and ultimately eliminate the transfer of harmful aquatic organisms and pathogens through the control and management of ships’ ballast water and sediments

MARINE EQUIPMENT

Prevention of air pollution from ships

Nitrogen Oxides (NOx):
Tier I, Tier II, Tier III
1) Revision of the code on alarms and indicator
2) Draft revised MODU Code
3) Measures to prevent accidents with lifeboats
4) Compatibility of life-saving appliances
5) Amendments to the guidelines for ships operating in arctic ice-covered waters
6) Guidelines for maintenance and repair of protective coatings
7) Cargo oil tank coating and corrosion protection
1) Performance testing and approval standards for fire safety systems
2) Fire resistance of ventilation ducts
3) Measures to prevent fires in engine-rooms and cargo pump-rooms
4) Fixed hydrocarbon gas detection systems on double-hull oil tankers
1) Development of guidelines and other documents for uniform implementation of the 2004 BWM Convention
2) Review of MARPOL ANNEX VI and the NO\textsubscript{x} technical code
3) Evaluation of safety and pollution hazards of chemicals and preparation of consequential amendments
4) Development of provisions for gas-fuelled ships
5) Review of the recommendation for material safety data sheets for MARPOL ANNEX I cargoes and marine fuels
1) Routing of ships, ship reporting and related matters
2) Development of an e-navigation strategy
3) Evaluation of the use of ECDIS and ENC development
4) Revision of the performance standards for INS and IBS
Safety and Environment Protection are core focus

IMO Centers in Safety

Environment protection
II. Shipbuilding Industry in face of Maritime Regulation
Impact of Maritime Regulation on Shipbuilding Industry

Technology Innovation

face a series of new technology that has little relationship with conventional ones

New Competition Pattern

Possible Transformation

change from simple manufacturer to lifetime service provider and take corporate social responsibility into consideration
Shipbuilding Industry in Face of Maritime Regulation
GHG—Energy Efficiency Design Index (EEDI)

Shipping Industry made initial proposal

IMO

EEDI = Propulsion load + Auxiliary/hotel load - Innovative technologies - Transport work
<table>
<thead>
<tr>
<th>General Design</th>
<th>Applied Rule (date &amp; revision)</th>
<th>Applied design method</th>
<th>SCF-specific</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deformation and Failure Modes</td>
<td>Applied alternative to Rule</td>
<td>alternative to Rule and subject structure(s)</td>
<td>Capacity Plan</td>
</tr>
<tr>
<td>Ultimate Strength</td>
<td>Calculating conditions and results;</td>
<td>Allowable loading pattern</td>
<td>Loading Manual</td>
</tr>
<tr>
<td></td>
<td>Assumed loading conditions</td>
<td>Maximum allowable hull girder bending moment and shear force</td>
<td>Trim &amp; Stability Booklet</td>
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<tr>
<td></td>
<td>Operational restrictions due to structural strength</td>
<td></td>
<td>Loading Instrument Instruction Manual</td>
</tr>
<tr>
<td>Safety Margins</td>
<td>Strength calculation results</td>
<td>density or storage factor</td>
<td>Operation and Maintenance Manuals</td>
</tr>
<tr>
<td></td>
<td>Gross hull girder section modulus</td>
<td>Bulky output of strength calculation</td>
<td>General Arrangement</td>
</tr>
<tr>
<td></td>
<td>Minimum hull girder section modulus</td>
<td>Plan showing highly stressed areas prone to yielding and/or buckling</td>
<td>Key Construction Plans</td>
</tr>
<tr>
<td></td>
<td>along the length of the ship to be maintained throughout the ship’s life</td>
<td>Structural drawings</td>
<td>Rudder and Rudder Stock</td>
</tr>
<tr>
<td></td>
<td>Gross scantlings of structural items</td>
<td>Rudder and Stern Frame</td>
<td>Structural Details</td>
</tr>
<tr>
<td></td>
<td>Net scantlings of structural items</td>
<td>Structural details of typical members</td>
<td>Production Plans</td>
</tr>
<tr>
<td></td>
<td>Hull form</td>
<td></td>
<td>Lines Plan</td>
</tr>
</tbody>
</table>
Continuous review for the past experience in face of the new concept.

A series of shipbuilding technology including design, construction and marine equipment needs to be improved.

Broader industries besides shipbuilding will get involved.

Energy efficiency and environment protection should be taken into consideration at the meantime, which requires new ship type development instead of part update.
Improvement of ships needs efforts from multi-industry.

NYK Super Eco Ship 2030: a reduction of CO₂ by 69 percent per container carried.

- Friction-resistant material
- Fuel cells
- Control
- Wind power
- Solar cells
III. Action from Shipbuilding Industry
Shipping Industry Takes Proactive Role

The Danish Initiative Green Ship of the Future

- Dual / Multi MCR Certification
- Turbo charging with variable nozzle rings
- EGR systems
- Waste Heat Recovery Systems
- Automated Engine Monitoring
- Scrubber Systems
- Optimized Control for Ship Cooling
- LNG Powered Fast Ferry
- Electronic Engine and VTR
- Air Cavity Systems
- Innovative Propeller Design
- Forum of Ship Officer Students
- Auxiliary Systems
- Lab on a Ship
- Performance Monitoring of Silicone Anti-Fouling
- Trim Optimisation
- Weather Routing
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Shipping Industry Takes Proactive Role

The Danish Initiative Green Ship of the Future

[Logos of various companies and organizations]
Classes Are Stepping Forward

DNV Triple-E: Environmental & Energy Efficiency Rating Scheme

CCS: “Green Ship Plan”
The Shipbuilding Research Center of Japan:
The main feature of the NOBS is a transversely
ranked bottom—required to maintain a draught
in order to sail safely without ballast water.
The resulting decrease in displacement is
compensated for by widening the breadth.

University of Michigan: Instead of hauling
potentially contaminated water across the ocean,
then dumping it in a Great Lakes port, a
ballast-free ship would create a constant flow
of local seawater through a network of large
pipes, called trunks, that runs from the bow
to the stern, below the waterline.
Committee of Elimination Substandard Ships

Committee for Expertise of Shipbuilding Specifics

response to the maritime regulations among shipbuilding industry.
Action from Shipbuilding Industry

China, Japan, Korea

Ship Owners, Classes

CESA

Shipbuilding

Cross Industry Submission
Action from Shipbuilding Industry

**Item 1**
Finalizing amendments to the text of the draft SCF guideline, verification guidelines and SOLAS amendments (if necessary and possible).

**Item 2**
Drafting list of information to be included in the SCF on board and SCF Supplement ashore. This would be a comprehensive list including highly intellectual property sensitive information which shall be stored ashore.

**Item 3**
Preparing a “standard” ranking of SCF information from intellectual property sensitivity point of view. It was agreed that a complete ranking would not be necessary for the MSC 87 submission. Nevertheless, the industry should be able to develop a concept and provide concrete examples (either as part of the submission or as part of a separate info paper).
**Item 4**
Developing an overall framework of the security system for SCF (hardware and software methods of protection).

**Item 5**
Drafting “standard” procedures for access to SCF. Both ship owner experts and yard experts shall provide practical examples and the reasoning behind.

**Item 6**
Designing a plan for archive centre(s). There can be many solutions. For instance, individual class might be interested in entering into contractual relationships for SCF Supplement storage purposes.
ISO/TC8 Links IMO and Industry

IMO

SCs

Marine environment protection
Navigation and ship operations
Ship design
......

ISO/TC8

Industry
| ISO 28000 | Specification for security management systems for the supply chain | Published |
| ISO 28001 | Security management systems for the supply chain- Best practices for implementing supply chain security- Assessments and plans- Requirements and guidance | Published |
| ISO 28002 | Resilience in the Supply Chain - Requirements with guidance for use | Under development |
| ISO 28003 | Security management systems for the supply chain- Requirements for bodies providing audit and certification of supply chain security management systems | Published |
| ISO 28004 | Security management systems for the supply chain- Guidelines for the implementation of ISO 28000 | Published |
| ISO 28005-1 | Security management systems for the supply chain- Electronic port clearance (EPC)- Message structures | Under development |
| ISO 28005-2 | Security management systems for the supply chain- Electronic port clearance (EPC)-Core date elements | Under development |
| ISO 20858 | Ships and marine technology - Maritime port facility security assessments and security plan development | Published |
| ISO 30000 | Ship recycling management systems - Specifications for management systems for safe and environmentally sound ship recycling facilities | Published |
| ISO 30001 | Ship recycling management systems - Best practice for ship recycling facilities - Assessment and plans | Under development |
| ISO 30002 | Ship recycling management systems - Guidelines for selection of ship recyclers (and pro forma contact) | Under development |
| ISO 30003 | Ship recycling management systems - Requirements for bodies providing audit and certification of ship recycling management systems | Published |
| ISO 30004 | Ship recycling management systems - Guidelines for implementing ISO 30000 | Under development |
| ISO 30005 | Ship recycling management systems - Information control for hazardous materials in the manufacturing chain of shipbuilding and ship operations | Under development |
| ISO 30006 | Ship recycling management systems - Illustration of the location of hazardous materials onboard ships | Under development |
| ISO 30007 | Ship recycling management systems - Guideline for measures to minimize asbestos emission and exposure at ship recycling | Under development |
| ISO 30008 | Ships and marine technology - Large yachts - Ship recycling management systems - Yachts recycling | Under development |
Environment Activities of ISO/TC8

- Green House Gas
- NO$_x$/SO$_x$ Reduction
- Underwater Irradiated Noise Impact
- Cold Ironing
- Ship Recycling
- Ballast Water
- Anti-Fouling System
- Oil/Chemical (Fuel/cargo)
- Garbage Waste
<table>
<thead>
<tr>
<th>VLCC Ballast water capacity</th>
<th>Type</th>
<th>Treatment rated capacity</th>
<th>Hour consumption</th>
<th>Power consumption</th>
<th>Energy consumption</th>
<th>Facility size</th>
</tr>
</thead>
<tbody>
<tr>
<td>100000 m³</td>
<td>1</td>
<td>200m³/h</td>
<td>500h</td>
<td>20 kw</td>
<td>10000 kwh</td>
<td>20 ft bulk container</td>
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<td>100000 m³</td>
<td>2</td>
<td>400m³/h</td>
<td>250h</td>
<td>40 kw</td>
<td>10000 kwh</td>
<td>40 ft bulk container</td>
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<td>800m³/h</td>
<td>125h</td>
<td>60 kw</td>
<td>7500 kwh</td>
<td>35 m²Foot Print</td>
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<tr>
<td>100000 m³</td>
<td>4</td>
<td>1,200m³/h</td>
<td>83h</td>
<td>120 kw</td>
<td>9960 kwh</td>
<td>52 m²Foot Print</td>
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<tr>
<td>100000 m³</td>
<td>5</td>
<td>1,600m³/h</td>
<td>63h</td>
<td>130 kw</td>
<td>8190kwh</td>
<td>69 m²Foot Print</td>
</tr>
</tbody>
</table>
GBS is compatible with GHG.

BWM is feasible for Industry.
Asian Shipbuilders Should Be More Active

Market Share: 95.5%

Ship Type: all except luxury ship

Regulation: long way to go
Working Groups between ASEF meetings (basic platform)?

ISO/TC8 Ships and Marine Technology Committee (cross industry platform)?

Committee for Expertise of Shipbuilding Specifics (CESS)?
Thank You for Your Attention!

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