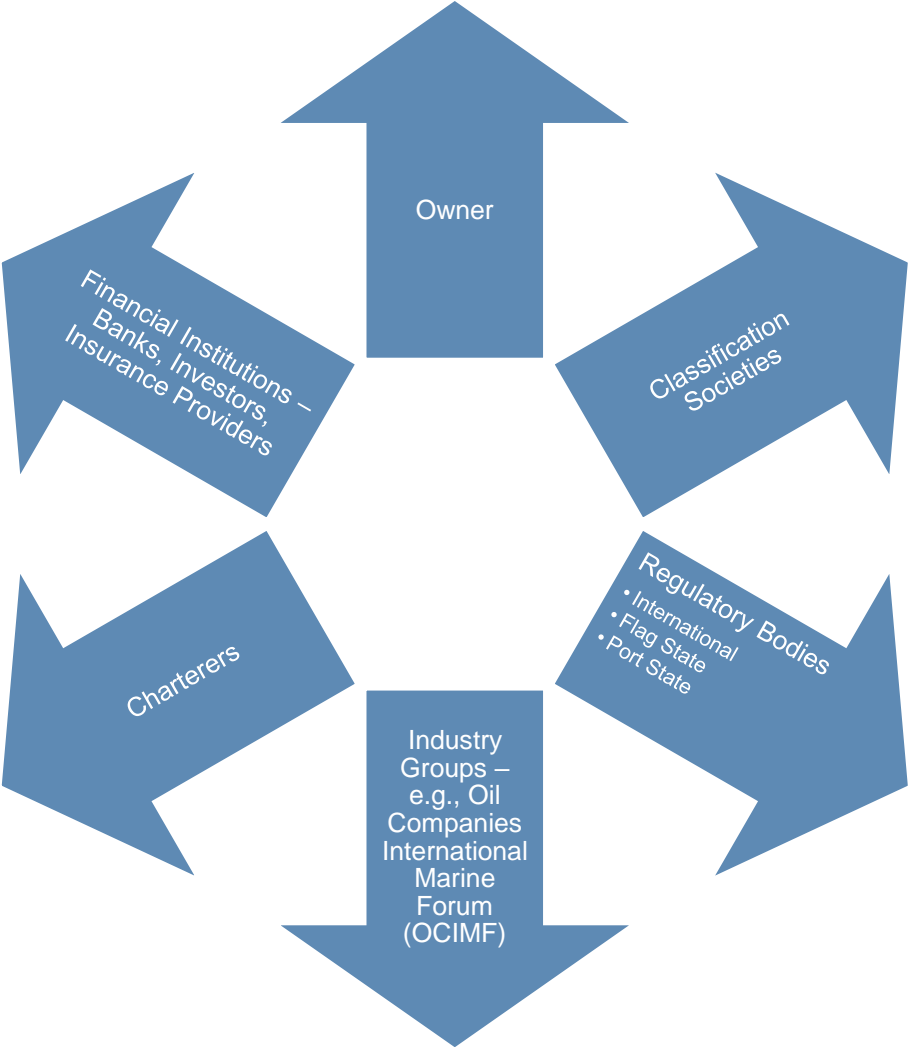


Sources of Standards and Regulations in the Maritime Industry



The use of ABS's trademarks (including without limitation the ABS logo) is prohibited without the express written consent of ABS.

Sources of Requirements on Marine Platform Design, Construction, and Operation



In the maritime industry standards address



Safety and Risk



Concern for

- Safety of passengers
- Health and wellbeing of operators
- Societal concerns
- Protection of the environment
- Safety of the asset
- Protection of the cargo
- Economic return



Efficiency and Effectiveness – Fit for purpose

Classification Societies

- Classification societies create and maintain technical standards for commercial marine platforms, including ships and floating structures
- Classification societies are non-governmental organizations
 - They may perform certain regulatory services through agreements with Flag and Port States
- Registering a ship with a specific class society is a voluntary transaction
- However, Flag and Port State regulations require categories of commercial marine platforms to be registered with a recognized classification society
- Classification society activities play a significant role in marine platforms' design, construction, and operational phases

Classification Societies – IACS Members

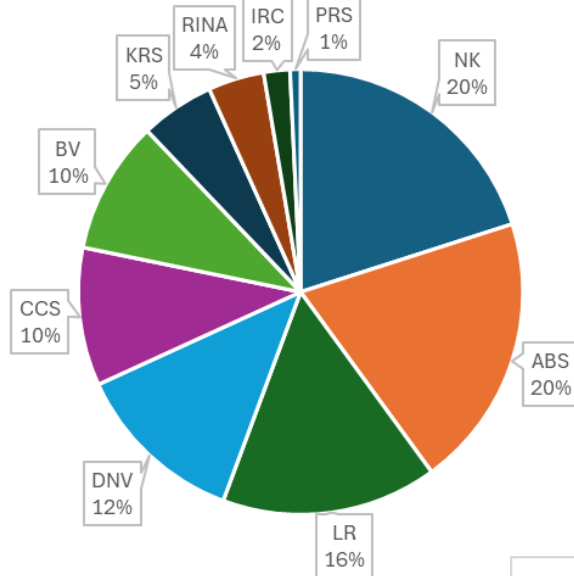
- American Bureau of Shipping (ABS) – <https://www.eagle.org>
- Bureau Veritas (BV) – <https://www.bureauveritas.com>
- China Classification Society (CCS) – <https://www.ccs.org.cn/ccswzen/>
- Croatian Register of Shipping (CRS) - <https://crs.hr/>
- DNV - <https://www.dnv.com/>
- Indian Register of Shipping (IRC) - <https://www.irclass.org>
- Korean Register of Shipping (KRS) - <https://www.krs.co.kr/eng/>
- Lloyds Register (LR) - <https://www.lr.org>
- Nippon Kaiji Kyokai (Class NK) (NK) - <https://www.classnk.com>
- Polish Register of Shipping (PRS) - <https://www.prs.pl>
- Registro Italiano Naval (RINA) - <https://www.rina.org/en>



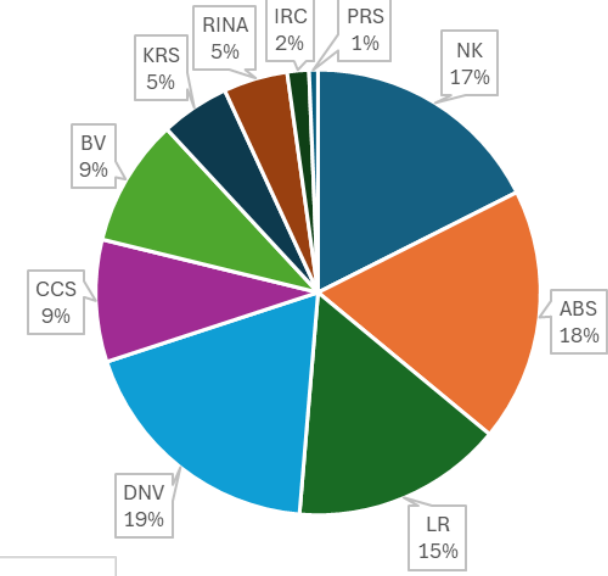
IACS member societies class over 90% of the world's ships by tonnage.

Top 10 Classification Societies 2023

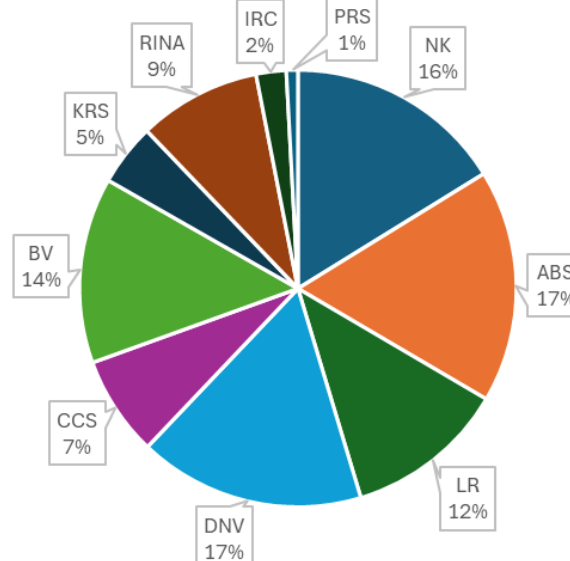
Top 10 Classification Societies by Deadweight



Top 10 Classification Societies by Gross Tonnage



Top 10 Classification Societies by Number of Vessels



Source:

<https://www.lloydlist.com/LL1146894/Top-10-classification-societies-2023>

The percent values shown are based on the amount classed with the individual class society relative to the total amount classed with the top 10 class societies.



Classification Society Rules

Classification societies develop standards that are called class rules

Class rules are based on knowledge, research, and industry experience

Registration with the society requires that the rules be met and verified through plan reviews, physical inspections called surveys, and audits

Class rules incorporate many other organizations' standards by reference

Portions of class rules parallel and expand upon flag state and international maritime regulations

Specific class rules can be prescriptive or performance-based

Recognized Standard Organizations in Classification Society Rules – Examples

- American National Standards Institute (ANSI)
- ASTM International (ASTM)
- British Standards Institute (BSI, “British Standard”)
- International Organization for Standardization (ISO)
- Institute of Electrical and Electronics Engineers (IEEE)
- American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE)
- American Society of Mechanical Engineers (ASME)
- American Gear Manufacturers Association (AGMA)
- International Electrotechnical Commission (IEC)
- National Electrical Manufacturers Association (NEMA)
- Tubular Exchanger Manufacturers Association (TEMA)
- American Petroleum Institute (API)
- American Welding Society (AWS)
- National Fire Protection Association (NFPA)
- SAE International (SAE)
- European Committee for Standardization (CEN)
- Japanese Industrial Standard (JIS)
- German Institute for Standards (DIN)

Example of Standard Incorporated by Reference

- ABS Rules for Building and Classing Marine Vessels – 2024
- Part 4 – Vessel Systems and Machinery
- Chapter 6 – Piping Systems
- Section 1 – General Provisions
- 3 – Definitions
- 3.9 – Pipe Schedule (2024)
 - “Pipe Schedules are designations of pipe wall thicknesses as given in ***American National Standard Institute, ANSI B36.10.***”

Classification Society Rules

Class Guides are issued to introduce newly implemented classification requirements and act as preliminary rules

Class Guidance Notes are issued as non-binding guidance providing information about industry best practices and knowledge

There is a formal process for creating new or altering existing class Rules, Guides, and Guidance Notes

Classification Rules – Conformity Assurance



Plan Reviews

Technical review of design plans, calculations, and documentation for a new vessel or vessel modifications

Verifies design complies with the governing Rules



Type Approval

A voluntary program that allows qualified manufacturers to benefit from having their products pre-certified for use in the marine and offshore sectors

Requires an engineering assessment of the product's design

Requires an assessment of the vendor's manufacturing and quality control processes

Satisfies certification requirements of flag states – US and EU



Surveys

Physical inspections of the ship by a certified classification society surveyor

Carried out during construction and operational phases of the ship's life

Verifies that the ship as built, maintained, and operated meets the relevant Rule requirements and regulations



Audits

Independent evidence-based review of an organization's practices and procedures

Verifies that the ship or facility and supporting organizations are operated per Rules, regulations, and internal policies and procedures

Rule Development/Revision – ABS Process



Proposed Rule Changes (PRC) may be initiated by anyone in the organization – staff, industry, committee members, etc.



Formal Process


Inception to completion takes approximately 1.25 years
Includes seven separate reviews
A PRC can be modified or withdrawn at any stage of the review process





Final review and approval provided by the Rules Committee

Sources of Proposed Rule Changes (PRC)


 Feedback from the service history of the ABS fleet


 ABS research and development initiatives

 National and international regulatory activities

 IACS Panels and Working Groups

 Professional Technical Societies

 Industry Groups

 Casualty Reports

PRC Procedure (ABS)

Review by the submitter's Manager

Review by Regional Rule Development Coordinators (RDCs)

Rules & Standards Review and Formatting

Internal Review

Regional and Special Committee Review

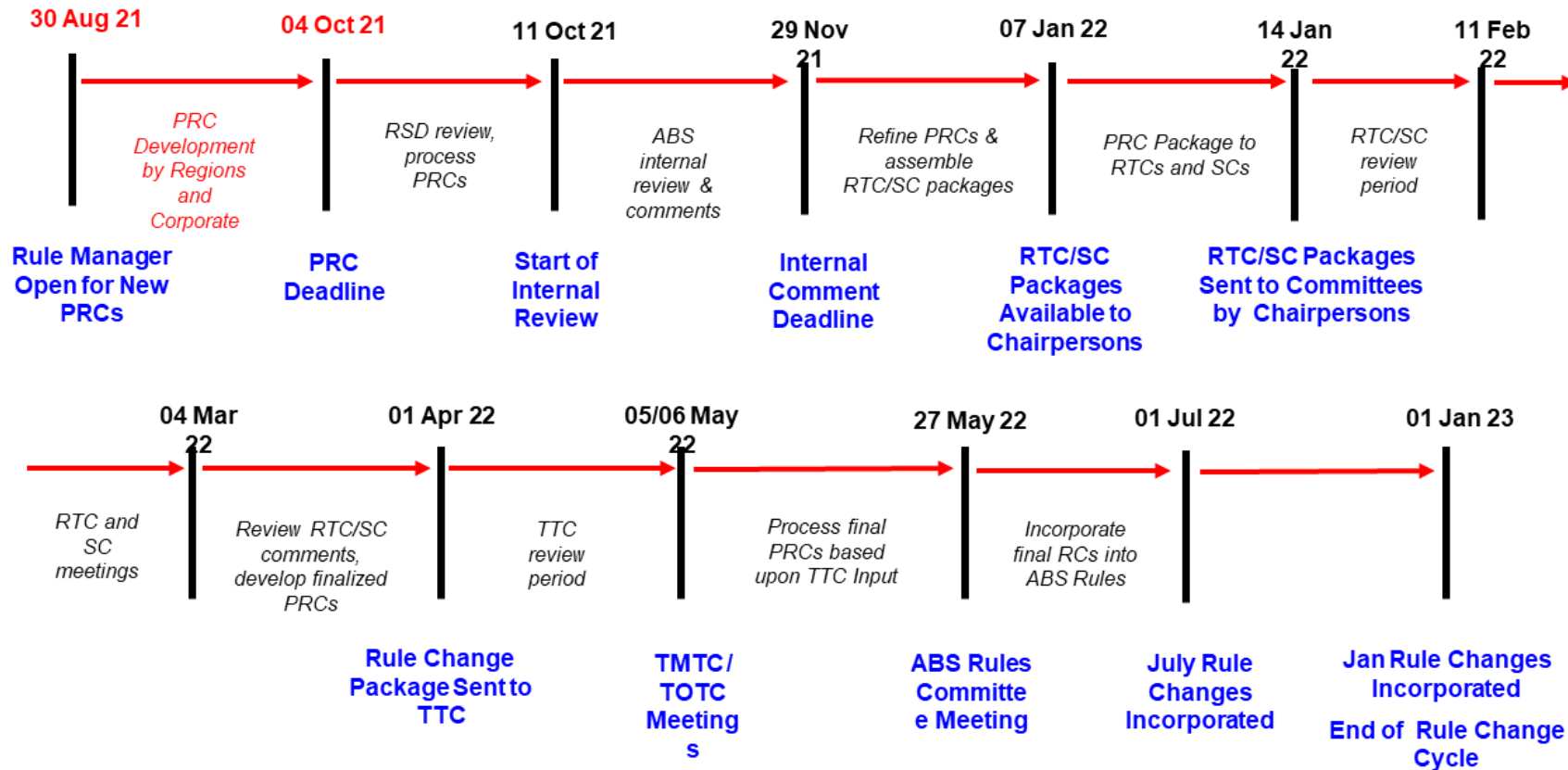
Marine and Offshore Technical Committee Review

Rules Committee Review and Approval

Note: Changes to Part 1, Rules For Conditions of Classification, are approved by the Class Committee



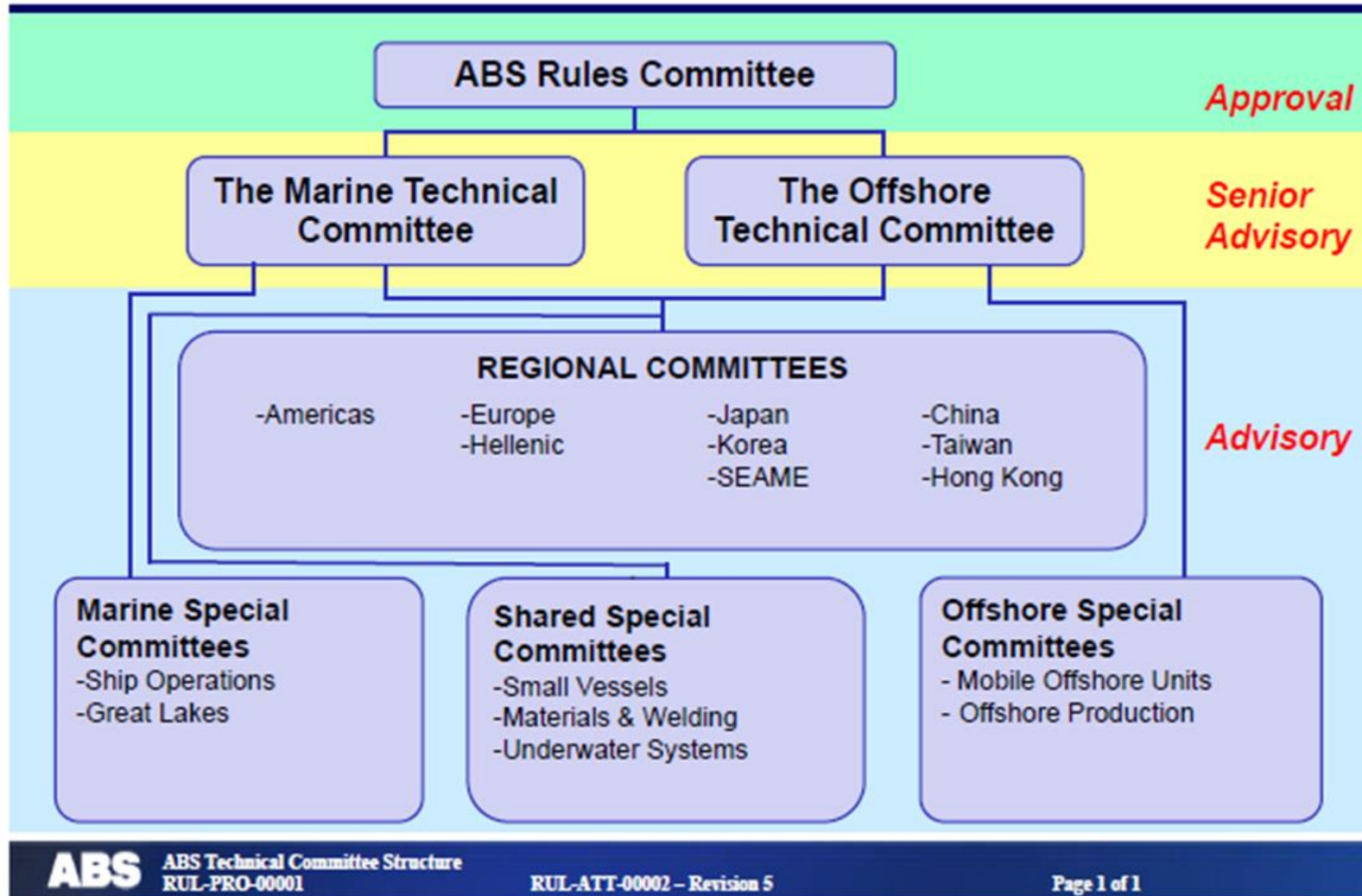
ABS Rule Development Sample Timeline



Acronyms

- RSD – Rule Development Coordinators
- RTC – Regional Technical Committee
- SC – Special Committee
- TTC – Technical Committees
- RC = Rules Committee

ABS Committee Structure



ABS Committees

Regional Technical Committee (RTC)

- Advise The Technical Committees concerning proposed Rules from a marine industry perspective within the geographic territory of the Region

Special Technical Committee (STC)

- Advise The Technical Committees on behalf of the Regional Technical Committee concerning proposed specialized Rules or special topics of Rules from the perspective of the marine industry within the geographic territory of the Region

Technical Committees – Marine and Offshore

- Senior advisory committee. Review all new or modified Rules

Rules Committee

- Final approval authority for all new or modified Rules

New and Existing Guide and Guidance Note Change Procedures

- Simpler processes that allows for quicker turnaround times
- Guide changes process is similar to the Rules change process without the Technical Committee Review
- As Guidance Notes contain only recommendations, VP of Global Engineering and Technology assumes final review and approval responsibilities

The IMO's Purpose

IMO—the International Maritime Organization—is the United Nations specialized agency responsible for the safety and security of shipping and the prevention of marine and atmospheric pollution by ships. IMO's work supports the UN sustainable development goals.

[imo.org](https://www.imo.org)



The parties involved in the activities of the IMO

Member States

- 176 nations

Intergovernmental Organizations

- Observer Status
- 66 organizations
- Examples
 - European Commission (EC)
 - Organization for Economic Cooperation and Development (OECD)

International Non-governmental Organizations (NGO)

- Consultive Status
- 89 Organizations
- Examples
 - Cruise Lines International Association (CLIA)
 - Environmental Defense Fund (EDF)

IMO Regulations and Guidance

Conventions

- Internationally developed treaties that are binding to all signatory nations

Codes

- A description of the standard international approach for complying with an aspect of the requirements of the IMO Conventions
- Explicitly states the detailed requirements of aspects of an IMO Convention

Resolutions

- Mandatory requirements not yet incorporated into a Convention or Code

Circulars

- Guidance developed by IMO as a recommendatory

Consensus Standards

- Recognized industry standards such as Class or ISO adopted as either mandatory or recommendatory



Administration and Enforcement of IMO Regulations



The IMO has no enforcement powers of its own



IMO member states national regulations must meet or exceed IMO regulations



Flag states are responsible for verifying that registered ships meet the IMO regulations

During design phase
During construction phase
During operational phase



Port states may verify vessels are operated and maintained in accordance with IMO requirements

Vessels not in compliance with IMO regulations may be detained or banned from territorial waters until corrective actions are taken and verified

Port States and the IMO



- Port States are the nations that controls ports that an internationally trading ship calls
- Example - When a Panamanian registered ship calls the port of Baltimore, the port state is the United States
- Port States have the right to inspect foreign ships in its ports to
 - Verify that the condition of a ship and its equipment complies with international regulations
 - Verify that a ship is operated and manned in accordance with international regulations
- Inspection schemes fall under the direction of Port State Control Agreements. Regional examples include
 - Europe and North Atlantic - Paris MOU
 - Asia and the Pacific - Tokyo MOU
 - Mediterranean - Mediterranean MOU
 - United States - United States Coast Guard

IMO Conventions - examples

| Abbreviation | Convention | Year of Adoption |
|--------------|--|-------------------|
| SOLAS | International Convention for the Safety of Life at Sea | 1974 as amended |
| MARPOL | International Convention for the Prevention of Pollution from Ships | 1973 (1978, 1997) |
| STCW | International Convention on Standards of Training Certification and Watchkeeping for Seafarers (and Manila Amendments) | 1995 |
| LL | International Convention on Load Lines | 1966 |
| TONNAGE | International Convention of Tonnage Measurements of Ships | 1969 |
| COLREG | Convention on the International Regulations for Preventing Collisions at Sea | 1972 |
| AFS | International Convention on the Control of Harmful Anti-fouling Systems on Ship | 2001 |
| BWM | International Convention for the Control and Management of Ship's Ballast Water and Sediments | 2004 |



IMO Codes - examples

| Abbreviation | Convention |
|--------------|--|
| IS | International Code on Intact Stability |
| HSC | International Code of Safety for High-Speed Craft |
| SPS | Code of Safety for Special Purpose Ships |
| MODU | Code for the Construction and Equipment of Mobile Offshore Drilling Units |
| FSS | International Code for Fire Safety Systems |
| LSA | International Life Saving Appliance Code |
| IMDG | International Code for the Maritime Transport of Dangerous Goods in Packaged Form |
| IBC | International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk |
| GC | Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk |
| INF | International Code for the Safe Carriage of Packages Irradiated Nuclear Fuel, Plutonium and High-Level Radioactive Wastes on Board Ships |

The structure of the IMO

Assembly

- Made up of all member states
- Highest governing body

Council

- Elected by the Assembly
- Acts as the executive organ of the organization

Committees

- Maritime Safety Committee (MSC)
- Marine Environment Protection Committee (MEPC)
- Legal Committee
- Technical Cooperation Committee
- Facilitation Committee

Marine Safety Committee (MSC) Subcommittees



- Carriage of Cargoes and Containers (CCC)
- Ship Design and Construction (SDC)
- Implementation of IMO Instruments (III)
- Navigation, Communications and Search and Rescue (NCSR)
- Human Element, Training and Watchkeeping (HTW)
- Ship Systems and Equipment (SSE)
- Pollution Prevention and Response (PPR)

MSC – International Convention for the Safety of Life as Sea (SOLAS)

| Chapter | Title |
|---------|--|
| I | General Provisions |
| II-1 | Construction – structure, subdivision and stability, machinery, and electrical installations |
| II-2 | Construction – fire protection, fire detection, and fire extinction |
| III | Life-saving appliances and arrangements |
| IV | Radiocommunications |
| V | Safety of navigation |
| VI | Carriage of cargoes |
| VII | Carriage of dangerous goods |
| VIII | Nuclear Ships |
| IX | Management for the safe operation of ships |

MSC – International Convention for the Safety of Life as Sea (SOLAS)

| Chapter | Title |
|---------|---|
| X | Safety measures for high-speed craft |
| XI-1 | Special measures to enhance maritime safety |
| XI-2 | Special measures to enhance maritime security |
| XII | Additional safety measures for bulk carriers |
| XIII | Verification of compliance |
| XIV | Safety measures for ships operating in polar waters |
| - | Amendments |



MEPC – International Convention for the Prevention of Pollution from Ships (MARPOL)

| Section | Title |
|-----------|--|
| General | <ul style="list-style-type: none">• International Convention for the Prevention of Pollution from Ships, 1973• Protocol of 1978• Protocol I: Provisions concerning reports on incidents involving harmful substances• Protocol II: Arbitration• Protocol of 1997 |
| Annex I | Regulations for the prevention of pollution by oil |
| Annex II | Regulations for the prevention of pollution by noxious liquid substances in bulk |
| Annex III | Prevention of pollution by harmful substances carried by sea in packaged form |
| Annex IV | Prevention of pollution by sewage from ships |
| Annex V | Prevention of pollution by garbage from ships |
| Annex VI | Prevention of air pollution by ships |

Amendments to IMO Conventions – Classical Amendment

CLASSICAL AMENDMENT PROCEDURES

States wishing to be bound by the amendments have to express their consent to be bound.

| Protocol | Explicit acceptance | |
|---|--|---|
| <p>A protocol is added to the treaty i.e. the 1978 Protocol to MARPOL 73 and the 1997 Protocol to MARPOL 73/78 (so called Annex VI)</p> | <p>Submission</p> | <p>of a proposed amendment by a Contracting Government to the MEPC</p> |
| <p>A protocol is in fact a new treaty with its own States Parties and own entry into force requirements</p> | <p>Circulation</p> | <p>of the proposed amendment at least six months before its consideration by the MEPC</p> |
| | <p>Consideration and adoption by MEPC</p> | <p>The whole Committee will consider the amendments which, in practice, would usually be adopted by a consensus. If there is no consensus – then it may come to the voting in which case an amendment will be adopted by 2/3 majority of Contracting Governments.</p> |
| | <p>Communication for acceptance</p> | <p>After the adoption the Secretary-General will communicate the text of the amendments to all Contracting Governments for acceptance 2/3 majority of acceptances is needed for the amendment to enter into force.</p> |
| | <p>Entry into force</p> | <p>This process is very time-consuming and most of the amendments adopted this way never entered into force.</p> |

Source:
<https://www.imo.org/en/About/Conventions/Pages/Default.aspx>

Amendments to IMO Conventions – Tacit Acceptance

TACIT ACCEPTANCE PROCEDURE

Originally **tacit acceptance procedure** was introduced to amend technical requirements with regards to shipping safety and the protection of environment. The procedure is also used to amend the limits of liability in certain conventions and is nowadays widely used to adopt new, or amend existing, **technical standards**.

| | |
|-----------------------------------|--|
| Submission | of a proposed amendment by a Contracting Government to the MEPC. |
| Drafting | of the amendment, usually in a sub-Committee (over several sessions, with a target completion date). |
| Consideration and approval | The draft amendment developed by the sub-committee is considered by the Committee and approved by the Committee. The approval stage is not a requirement under MARPOL but is a well-established practice at IMO. The Committee decides at which session the amendments should be adopted. |
| Circulation | of the proposed amendment at least six months before its consideration by the MEPC. |
| Consideration and adoption | <p>The Committee reviews the draft again and if further drafting issues are identified, the draft will be sent to a drafting group for a further improvement.</p> <p>The whole Committee adopts the amendment and decides on the dates of the deemed acceptance and of the entry into force of the amendment.</p> |
| Deemed acceptance | In the case of an amendment to the Annexes to MARPOL, the amendment is considered accepted at the end of a period which shall not be less than 10 months after the date of adoption, unless within that period more than one third of the Parties object to the amendment. This period is usually 12 months for MARPOL. |
| Entry into force | The amendment will enter into force six months after the date of deemed acceptance , except for Parties that have specifically objected to it, or require express (explicit) acceptance of the amendment. |
| Enforcement | Enforcement falls under the remit of Governments and national authorities of States that are Parties to MARPOL - IMO has no operational mandate but supports implementation through technical assistance. |

Source:
<https://www.imo.org/en/About/Conventions/Pages/Default.aspx>

Flag states

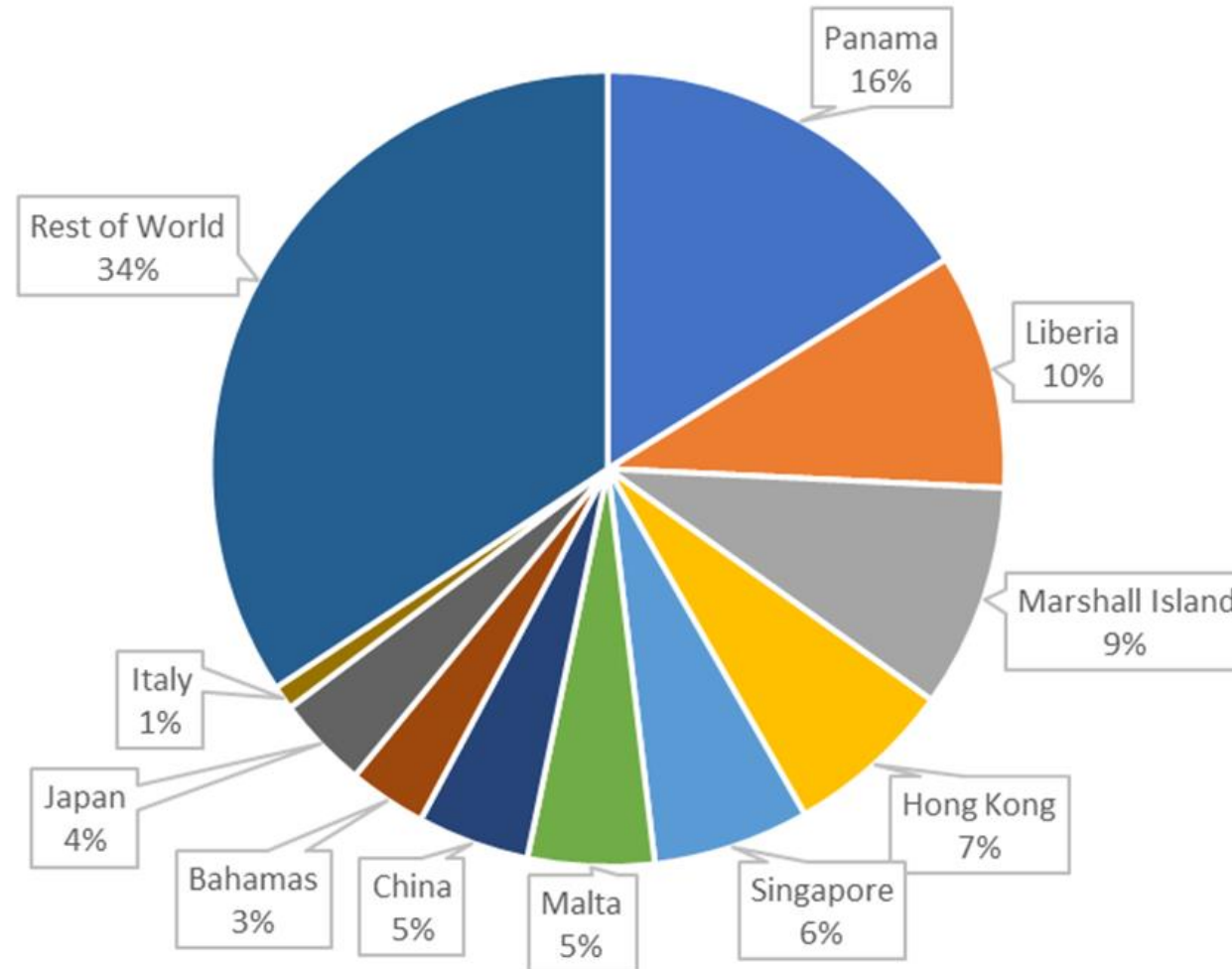


- A nation where a commercial enterprise registers its merchant ships and marine platforms
 - Owners may not need to be citizens in the country where the ship is registered
- Sets the conditions for registration
 - Ownership structure and requirements for the ship
 - Assessment of taxes and fees
 - Manning of asset
 - Design, construction, and operational requirements
 - Inspection regimen
- Member state of the IMO

Flag State Responsibilities

| | |
|-----------------------------|--|
| Maintaining | Maintaining a list of ships registered with the nation |
| Developing and enforcing | Developing and enforcing maritime regulations |
| Determining and documenting | Determining and documenting the tonnage of registered ships |
| Conducting | Conducting regular inspections of ships |
| Issuing | Issuing required certificates for ships |
| Participating | Participating in the International Maritime Organization (IMO) |
| Following | Following applicable international agreements |
| Regulating | Regulating domestic shipping |

Ten Largest Flag States by Fleet Size by Gross Tonnage (GT) (2020)



Source: www.unctad.org

United States of America as a Flag State

- The US is a member state of the IMO
- US regulations relating to US flag shipping reflect the IMO Conventions, Codes, and Resolutions
- Certain US regulations exceed the requirements set by the IMO
- Marine safety and environmental protection regulations are contained in the Code of Federal Regulations(CFR)
 - Title 46, Shipping
 - Title 33, Navigation and Navigable Waters
- The roles and duties of the flag state fall to the US Coast Guard (USCG)
- The USCG collaborates with Classification Societies acting as Recognized Organizations (RO) to carry out certain regulatory tasks

US CFR Title 46 - Shipping

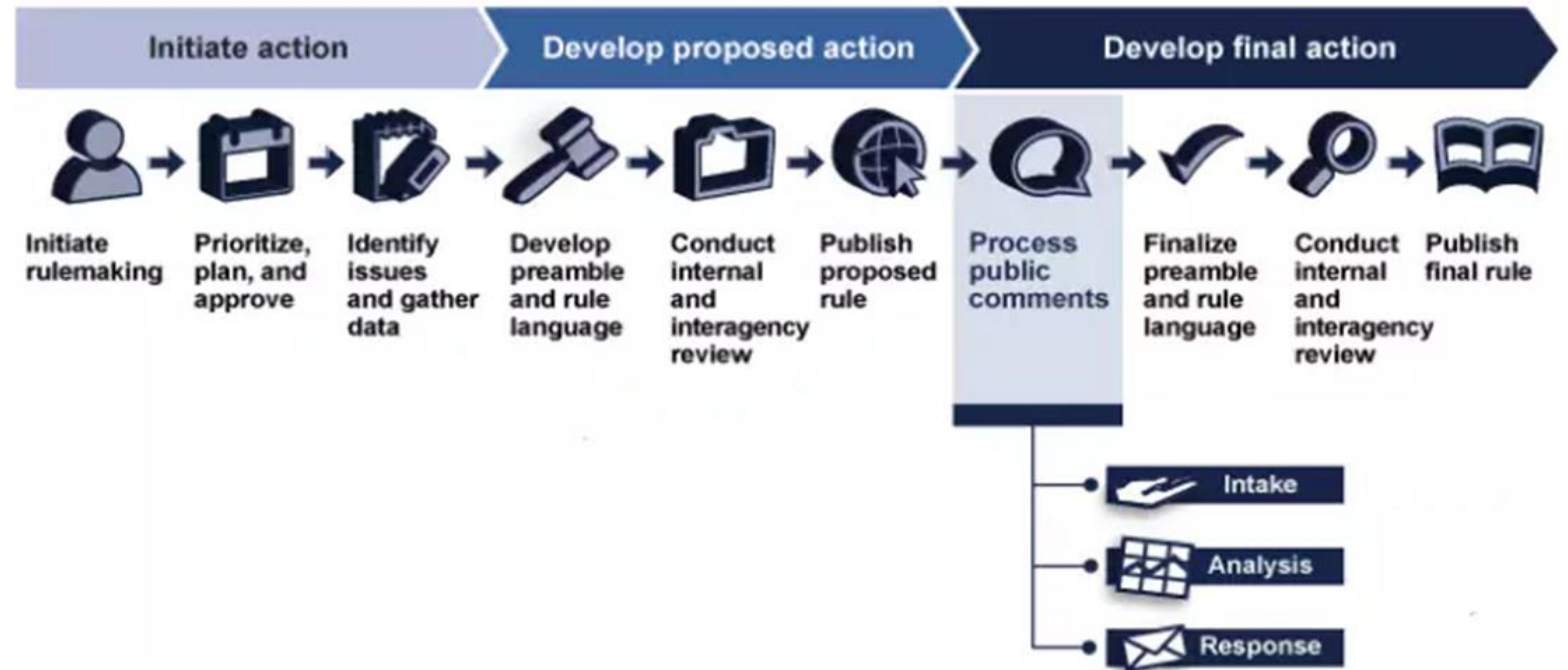
| Part | Subject |
|------|--|
| A | Procedures Applicable to the Public |
| B | Merchant Marine Officers and Seamen |
| C | Uninspected Vessels |
| D | Tank Vessels |
| E | Load Lines |
| F | Marine Engineering |
| G | Documentation and Measurement of Vessels |
| H | Passenger Vessels |
| I | Cargo and Miscellaneous Vessels |
| J | Electrical Engineering |
| K | Small Passenger Vessels carrying more than 150 Passengers or with Overnight Accommodations for More Than 49 Passengers |

| Part | Subject |
|------|---|
| L | Offshore Supply Vessels |
| M | Towing Vessels |
| N | Dangerous Cargoes |
| O | Certain Bulk Dangerous Cargoes |
| Q | Equipment, Construction, and Materials: Specifications and Approval |
| R | Nautical Schools |
| S | Subdivision and Stability |
| T | Small Passenger Vessels (Under 100 GT) |
| U | Oceanographic Research Vessels |
| V | Marine Occupational Safety and Health Standards |
| W | Lifesaving Appliances and Arrangements |

How US Regulations are Created

The process for creating federal regulations generally has three main phases: initiating rulemaking actions, developing proposed rules, and developing final rules. In practice, however, this process is often complex, requiring regulatory analysis, internal and interagency reviews, and opportunities for public comments.

gao.gov



Source: GAO. | GAO-20-383R

U.S. Regulatory Agencies in Ship Design, Construction, and Operation of US Flag Ships



- United States Coast Guard (USCG)
- United States Environmental Protection Agency (EPA)
- United States Federal Communications Commission (FCC)
- United States Maritime Administration (MARAD)
- United States Public Health Service (USPHS)
- Occupational Safety and Health Administration (OSHA)

USCG Shipping Regulations and Guidance



Regulations

Code of Federal Regulations
46 CFR and 33 CFR



Policy

Navigation and Vessel Inspection
Circulars – NVIC
Policy File Memorandum – PFM
Marine Safety Center Technical
Note – MTN



Consensus Standards

Recognized industry standards
adopted as mandatory

- Class Society Rules
- ASTM Standards
- Etc.

USCG Director of Commercial Regulations and Standards

- “develops national regulations, standards, and policies to enhance maritime safety, security, and stewardship; develops and executes an engagement plan for international standards development; and administers a technical compliance program to ensure uniform application of design and operating standards on commercial vessels.” - www.dco.uscg.mil/Our-Organization/Assistant-Commandant-for-Prevention-Policy-CG-5P/Commercial-Regulations-Standards-CG-5PS
- Areas of Expertise
 - Design and Engineering Standards
 - Operating and Environmental Standards
 - Standards Evaluation and Development



USCG Office of Design and Engineering Standards

- “Responsible for developing and promulgating national regulations and standards that govern the safe design and construction of ships and shipboard equipment.” - www.dco.uscg.mil/CG-ENG
- Technical Divisions
 - Naval Architecture – stability, structures, and load lines
 - Systems Engineering – marine electrical and mechanical systems, equipment approvals
 - Lifesaving and Fire Safety Division – lifesaving and fire safety standards and regulations, equipment approvals
 - Hazardous Materials Division – transportation, storage, and handling of hazardous materials in the marine environment

USCG Office of Operating and Environmental Standards

- “Develops standards regulating maritime industry through international treaties and U.S. statutes, regulations, and policy” - www.dco.uscg.mil/Our-Organization/Assistant-Commandant-for-Prevention-Policy-CG-5P/Commercial-Regulations-standards-CG-5PS/office-oes
- Divisions
 - Vessel and Facility Operating Standards
 - Environmental Standards



USCG Office of Standards Evaluation and Development

- “provides project management and economic and environmental analytical services in coordination with other RDP partners to support Coast Guard program offices responsible for overseeing regulations.” - www.dco.uscg.mil/Our-Organization/Assistant-Commandant-for-Prevention-Policy-CG-5P/Commercial-Regulations-standards-CG-5PS/office-reg
- Divisions
 - Standards Evaluation and Analysis
 - Project Management

USCG Marine Safety Center

- “supports the people and objectives of the Marine Safety, Security, and Environmental Protection programs through the verification of compliance with technical standards for the design, construction, alteration, and repair of commercial vessels.” – www.dco.uscg.mil/Our-Organization/Assistant-Commandant-for-Prevention-Policy-CG-5P/Commercial-Regulations-Standards-CG-5PS/Marine-Safety-Center-CG-MSC
- Reviews and approves plans for the design, construction, alteration, and repair of US flag and certain foreign flag commercial vessels subject to US and international laws, regulations, and standards.
- Divisions
 - Hull Division – general arrangements, structures, stability, and structural fire protection
 - Engineering Division – machinery, electrical, and control systems and components
 - Tank Vessel/Offshore Division – tankship-specific requirements
 - Tonnage Division – gross and net tonnage admeasurement
 - Vessel Security Division – vessel security plans
- Produces Plan Review Guidance (PRG) documents that specify the nature and requirements of specific design reviews
 - Example – C1-24 Oil and Chemical Tankship Structures

Examples of Requirements/Recommendations from Charters and Industry Groups

Oil Companies International Marine Forum (OCIMF) –

www.ocimf.org

- Mooring Equipment Guidelines
- Recommendations for Liquefied Gas Carrier Manifolds
- Recommendations for Oil and Chemical Tanker Manifolds and Associated Equipment
- International Safety Guide for Oil Tankers and Terminals

Tanker Structure Cooperative Forum (TSCF) –

www.tscforum.org

- Guidance Manual for Tanker Structures

Additional Standards Generating Industry Organizations – examples

- American Boat & Yacht Council (ABYC) – www.abycinc.org
- Society of International Gas Tanker and Terminal Operators (SIGTTO) - www.sigtto.org
- Society of Naval Architects and Marine Engineers (SNAME) – www.sname.org

Vessel Vetting

- Vetting is an inspection and evaluation process used by ship charterers
- Purpose of vetting is
 - Determine that the ship is fit for purpose
 - Assess the charterer's exposure to risk from the employment of the ship
 - Safety
 - Environmental protection
- Vetting process evaluates
 - Physical condition of ship and system
 - Compliance with regulations and standards
 - Safety and pollution records of ship
 - Operational practices, records, and history
 - Maintenance records
- Vetting process results in a rating score for the vessel
- OCIMF is a leading vetting organization

Review Questions

1. What are the main focus areas for the standards used in the marine industry?
2. How are classification societies related to flag and port state authorities?
3. What is the primary function of a classification society relative to a commercial ship?
4. Visit an IACS member's website and summarize the organization's mission.
5. What are Class Rules?
6. What are the sources of the Class Rules?
7. What mechanisms are used to ensure class rules are being followed?
8. How are class rules updated and revised?
9. What is the purpose of the IMO?
10. In what forms are IMO's regulations distributed?
11. What is the focus of SOLAS?
12. What is the focus of MEPC?
13. What ships must meet IMO regulations? How do flag state regulations relate to IMO conventions and codes?
14. Where are US flag state regulations published?
15. What specific organization reviews and approves design plans for all US flag ships? How do charterers influence ship design, operations, and maintenance?

Resources

- <https://ww2.eagle.org/en.html> (ABS)
- <https://iacs.org.uk/> (IACS)
- <https://www.imo.org/en> (IMO)
- <https://www.uscg.mil/> (US Coast Guard)
- <https://www.register-iri.com/> (Marshall Islands Ship Registry)
- <https://parismou.org/> (Paris MOU Port State Control)

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