

# IACS



## What are classification societies?

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## Introduction

### Classification societies today

Classification societies are organizations that establish and apply technical standards in relation to the design, construction and survey of marine related facilities including ships and offshore structures. These standards are issued by the classification society as published rules. A vessel that has been designed and built to the appropriate rules of a society may apply for a Certificate of Classification from that society. The society issues this certificate upon completion of relevant classification surveys.

Such a certificate does not imply, and should not be construed as an express warranty of safety, fitness for purpose or seaworthiness of the ship. It is an attestation only that the vessel is in compliance with the standards that have been developed and published by the society issuing the classification certificate.

More than 50 organizations worldwide define their activities as providing marine classification. Ten of those organizations form the International Association of Classification Societies (IACS). It is estimated that these ten societies, together with the two additional societies that have been accorded associate status by IACS, collectively class about 94 percent of all commercial tonnage involved in international trade worldwide. A listing of the IACS member societies, and the associates, is provided in appendix.

Classification is one element within a network of maritime safety partners. Other elements are parties such as the shipowner, the shipbuilder, the flag State, port States, underwriters, shipping financiers and charterers among others.

The role of classification and classification societies has been recognized in the International Convention for the Safety of Life at Sea, (SOLAS) and in the 1988 Protocol to the International Convention on Load Lines. This statutory role is addressed later in this note.

As an independent, self-regulating body, a classification society has no commercial interests related to ship design, ship building, ship ownership, ship operation, ship management, ship maintenance or repairs, insurance or chartering. In establishing its rules, each classification society may draw upon the advice and review of members of the industry who are considered expert in their field.

Classification rules are developed to contribute to the structural strength and integrity of essential parts of the ship's hull and its appendages, and the reliability and the function of the propulsion and steering systems, power generation and those other features and auxiliary systems which have been built into the ship in order to maintain essential services on board. Classification rules are not intended as a design code and in fact cannot be used as such.

A ship built in accordance with an IACS Member's rules will be assigned a class designation by the society on satisfactory completion of the relevant surveys. For ships in service, the society carries out surveys to ascertain that the ship remains in compliance with those rules. Should any defects that may affect class become apparent, or damages be sustained between the relevant surveys, the ship owner and operator are required to inform the society concerned without delay.

A ship is maintained in class provided that the relevant rules have, in the opinion of the society concerned, been complied with and surveys carried out in accordance with its rules.

Classification societies also maintain significant research departments that contribute towards the on-going development of appropriate, advanced technical standards.

## Why is it called classification?

In the second half of the 18<sup>th</sup> century, marine insurers, based at Lloyd's coffee house in London, developed a system for the independent inspection of the hull and equipment of ships presented to them for insurance cover. In 1760 a Committee was formed for this express purpose, the earliest existing result of their initiative being *Lloyd's Register Book* for the years 1764-65-66.

At that time, an attempt was made to 'classify' the condition of each ship on an annual basis. The condition of the hull was classified A, E, I, O or U, according to the excellence of its construction and its adjudged continuing soundness (or otherwise). Equipment was G, M, or B: simply, good, middling or bad. In time, G, M and B were replaced by 1, 2 and 3, which is the origin of the well-known expression 'A1', meaning 'first or highest class'.

The concept of classification caught on around the world. Bureau Veritas (BV) was founded in Antwerp in 1828, moving to Paris in 1832. 'Lloyd's Register of British and Foreign Shipping' was reconstituted as a self-standing 'classification society' in 1834; rules for construction and survey were published the same year.

Registro Italiano Navale (RINA) dates from 1861; American Bureau of Shipping (ABS) traces its origins back to 1862. Adoption of common rules for ship construction by Norwegian insurance societies in the late 1850s led to the establishment of Det Norske Veritas (DNV) in 1864. Germanischer Lloyd (GL) was formed in 1867 and Nippon Kaiji Kyokai (ClassNK) in 1899. The Russian Maritime Register of Shipping (RS) was an early offshoot of the River Register of 1913. More recent foundations have been Yugoslav Register of Shipping (now the Croatian Register of Shipping (CRS)) in 1949, China Classification Society (CCS), 1956; Korean Register (KR), 1960; and Indian Register of Shipping (IRS), 1975.

As the classification profession evolved, the practice of assigning different classifications has been superseded, with some exceptions. Today a ship either meets the relevant class society's rules or it does not. As a consequence it is either 'in' or 'out' of 'class'. However, each of the classification societies has developed a series of notations that may be granted to a vessel to indicate that it is in compliance with some additional criteria that may be either specific to that vessel type or that are in excess of the standard classification requirements.

## The International Association of Classification Societies - IACS

IACS can trace its origins back to the International Load Line Convention of 1930 and its recommendations. The Convention recommended collaboration between classification societies to secure "*as much uniformity as possible in the application of the standards of strength upon which freeboard is based...*".

Following the Convention, RINA hosted the first conference of major societies in 1939 - also attended by ABS, BV, DNV, GL, LR and NK - which agreed on further cooperation between the societies.

A second major class society conference, held in 1955, led to the creation of Working Parties on specific topics and, in 1968, to the formation of IACS by seven leading societies. The value of their combined and unique level of technical knowledge and experience was quickly recognised. In 1969, IACS was given consultative status with IMO. It remains the only non-governmental organisation with Observer status which is able to develop and apply rules.

Compliance with the IACS Quality System Certification Scheme (QSCS) and observance of the IACS Code of Ethics is mandatory for both IACS Member and Associate status.

## IACS Code of Ethics

The Code of Ethics is the bedrock of the IACS members' work and can be found on the IACS website [www.iacs.org.uk](http://www.iacs.org.uk).

It states, inter alia:

*"Classification Societies live on their reputation. Acceptance of their technical work can only be maintained by continuously proving integrity and competence."* and

*"Competition between Societies shall be on the basis of services (technical and field) rendered to the marine industry but must not lead to compromises on safety of life and property at sea or to the lowering of technical standards."*

## Classification

### Scope of classification

Implementing the published rules, the classification process consists of:

- A technical review of the design plans and related documents for a new vessel to verify compliance with the applicable rules;
- Attendance at the construction of the vessel in the shipyard by a classification society surveyor(s), and at the relevant production facilities that provide key components such as the steel, engine, generators and castings, to verify that the vessel is constructed in accordance with the classification rules;
- Upon satisfactory completion of the above, the shipowner's request for the issuance of a class certificate will be considered by the relevant classification committee, or another body, of the class society and, if deemed satisfactory, the assignment of class will be approved and a certificate of classification issued;
- Once in service, the owner must submit the vessel to a clearly specified program of periodical class surveys, carried out onboard the vessel, to verify that the ship continues to meet the relevant rule conditions for continuation of class.

Class rules do not cover every piece of structure or item of equipment on board a vessel, nor do they cover operational elements. Activities which generally fall outside the scope of classification include such items as: design and manufacturing processes; choice of type and power of machinery and certain equipment (e.g. mooring bitts, capstans and winches); number and qualification of crew or operating personnel; form and cargo carrying capacity of the ship and manoeuvring performance; hull vibrations; spare parts; life-saving appliances and maintenance equipment. These matters may however be given consideration for classification according to the type of ship or class notation(s) assigned.

It should be emphasized that it is the shipowner who has total control over a vessel, including the manner in which it is operated and maintained. Classification is voluntary and its effectiveness depends upon the shipowner, and other interests, operating in good faith by disclosing to the class society any damage or deterioration that may affect the vessel's classification status. If there is the least question, the owner should notify class and schedule a survey to determine if the vessel is in compliance with the relevant class standard.

It must also be emphasized that a class surveyor may only go on board a vessel once in a twelve-month period, for the annual survey. At that time it is neither possible, nor expected that the surveyor scrutinize the entire structure of the vessel or its machinery. The survey involves a sampling, for which guidelines exist based upon empirical experience which may

indicate those parts of the vessel or its machinery that may be subject to corrosion, or are exposed to the highest incidence of stress, or may be likely to exhibit signs of fatigue or damage.

## **Assignment, maintenance, suspension and withdrawal of class**

Class is assigned to a ship upon the completion of satisfactory surveys, undertaken in order to check compliance with the rules of the society, at the time of newbuilding. Specific procedures apply when an existing ship is transferring from one class society to another.

Classed ships are subject to surveys to continue in class. These surveys include the class renewal (also called “special survey”), intermediate survey, annual survey, and bottom/docking surveys of the hull. They also include tailshaft survey, boiler survey, machinery surveys and surveys for the maintenance of additional class notations, where applicable.

The surveys are to be carried out in accordance with the relevant class requirements in order to confirm that the condition of the hull, machinery, equipment and appliances is in compliance with the applicable rules.

The classification of a ship is based on the understanding that the ship is loaded, operated and maintained in a proper manner by competent and qualified crew or operating personnel. It is the Owner's responsibility to ensure proper maintenance of the ship until the next survey required by the rules. It is the duty of the Owner, or its representative, to inform the surveyor, on boarding the ship, of any events or circumstances affecting the class.

Where the conditions for the maintenance of class are not complied with, class will be suspended, withdrawn or revised to a different notation, as deemed appropriate by the society when it becomes aware of the condition. The ship may lose its class either temporarily or permanently. In the former case it is referred to as “suspension” of class; in the latter case as “withdrawal” of class. In the case of surveys that are not carried out within the specified time frame, or if the vessel is operated in a manner that is outside its classification designation, the suspension may be automatic.

## **Classification surveys**

A classification survey is a visual examination that normally consists of:

- an overall examination of the items for survey,
- detailed checks of selected parts,
- witnessing tests, measurements and trials where applicable.

When a surveyor identifies corrosion, structural defects or damage to hull, machinery and/or any piece of its equipment which, in the opinion of the surveyor, affects the ship's class, remedial measures and/or appropriate recommendations/conditions of class are implemented before the ship continues in service.

‘Recommendation’ and ‘condition of class’ are synonymous terms used by IACS societies for requirements that specific measures, repairs, request for surveys etc., are to be carried out by the owner within a specified time period in order to retain class.

Each classed vessel is subject to a specified program of periodic surveys after delivery. These are based on a five year cycle and consist of annual surveys, an intermediate survey and a class renewal/special survey (held every 5 years). The rigor of each specified survey increases with the age of the vessel.

The class renewal surveys/special surveys include extensive out-of-water examinations to verify that the structure, main and essential auxiliary machinery, systems and equipment of the ship remain in a condition which satisfies the rules. The examination of the hull is supplemented, when specified, by ultrasonic thickness measurements and the witnessing of tests as specified in the rules and as deemed necessary by the attending surveyor. The survey is intended to assess whether the structural integrity remains effective and to identify areas that exhibit substantial corrosion, significant deformation, fractures, damages or other structural deterioration.

Depending upon the age, size, type and condition of the vessel, the renewal/special survey may take several weeks to complete.

The intermediate survey (held approximately half way between special surveys) includes examinations and checks as specified in the rules to determine whether the ship remains in a general condition which satisfies the rule requirements. According to the type and age of the ship, drydocking may be required and the examinations of the hull may be supplemented by ultrasonic thickness measurements as specified in the rules and where deemed necessary by the attending surveyor.

At the time of annual surveys, the ship is generally examined. The survey includes an external, general inspection of the hull, equipment and machinery of the ship and some witnessing of tests, so far as is necessary and practical in order to determine whether the ship remains in a general condition which satisfies the Rule requirements. Older ships of certain types may also be subject to a general examination of some specified internal areas of the hull. Depending upon the age, size, type and condition of the vessel, an annual survey may take from several hours to a few days to complete.

### **Statutory certification of ships**

#### **Framework**

The United Nations Convention on the Law of the Sea (UNCLOS) is an umbrella convention concerned with many aspects of the sea and its uses, including the granting of registration of a ship by a State. Once a ship is registered, the flag State has certain duties laid out in UNCLOS. In particular, under Article 94, the flag State must *“effectively exercise its jurisdiction and control in administrative, technical and social matters over ships flying its flag”* and take *“such measures for ships flying its flag as are necessary to ensure safety at sea.....”*

International Conventions have been agreed, setting out uniform standards to facilitate acceptance of a ship registered in one country in the waters and ports of another and in the general furtherance of safety at sea and protection of the environment. These standards are commonly referred to as ‘statutory’ requirements. Broadly, they cover three distinct areas:

- 1) Aspects of the ship’s design and its structural integrity – load line and stability in the intact and damaged condition, essential propulsion, steering equipment, etc.;
- 2) Accident prevention, including navigational aids and pollution and fire prevention;
- 3) The situation after an accident (fire, flooding) including containment and escape.

Some or all of these may also be reproduced in a particular class society’s rules.

SOLAS Ch II-1, Reg 3-1 states that, in addition to the requirements of the other (SOLAS) regulations, ships shall be designed, constructed and maintained in compliance with the structural, mechanical and electrical requirements of a classification society which is recognised by the Administration in accordance with the provisions of regulation XI/1 (see



below), or with applicable national standards of the Administration which provide an equivalent level of safety.

Where the classification survey result is taken as evidence of compliance with the corresponding statutory requirement, e.g. load line or safety construction (hull, machinery, boilers, electrical equipment, etc.), this survey is de facto given the status of a statutory survey on behalf of the flag Administration, if the society is acting as its recognised organisation in this respect.

When a ship is suspended or withdrawn from class, IACS members notify the flag Administration concerned and publish the information e.g. on its website. As a consequence, the flag administration generally invalidates the statutory certificates concerning construction and equipment.

### **Recognised Organisations**

SOLAS and the other International Conventions permit the flag Administration to delegate the inspection and survey of ships to a Recognised Organisation (RO). The organisation is empowered to require repairs or other corrective action to a ship. It may also carry out inspections and surveys if requested by the appropriate authorities of a port State.

IMO Resolution A 739(18) lays down minimum standards for ROs. Fundamentally it requires the organisation to demonstrate its technical competence and to be governed by the principles of ethical behaviour. The RO should be subject to the certification of its quality system by an independent body of auditors accepted by the Administration.

Together with IMO Resolution A.789(19), which presents specifications on the survey and certification functions of ROs, these resolutions provide the criteria and framework to which a flag must be satisfied that their RO's meet. IACS Members have been found to meet resolutions A.739(18) and A.789(19) by all of the Administrations (approximately 100) that are Parties to SOLAS.

The RO is responsible and accountable to the flag Administration for the work that it carries out on its behalf. The principles of the inspection and survey work are the same as in respect of classification surveys, that is the verification by the RO that a ship is in compliance with applicable requirements at the time of the survey. The scope of these inspections and surveys regarding safety and pollution prevention are laid down by the flag Administration in compliance with the relevant international conventions to which it is a signatory.

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## Appendix

The members of IACS are:

### Members

ABS	American Bureau of Shipping
BV	Bureau Veritas
CCS	China Classification Society
DNV	Det Norske Veritas
GL	Germanischer Lloyd
KR	Korean Register of Shipping
LR	Lloyd's Register
NK	Nippon Kaiji Kyokai (ClassNK)
RINA	Registro Italiano Navale
RS	Russian Maritime Register of Shipping

### Associates

CRS	Hrvatski Registar Brodova (Croatian Register of Shipping)
IRS	Indian Register of Shipping

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