TECHNICAL TERMS

Below explanations of terms frequently used in our web-site. The explanations are much simplified to make it understandable to all readers. If more in depth information is required, then corresponding technical books etc. must be consulted.

Numbers:

LR-Number

In the old days, when Great Britain was the leading ship builder and shipping nation, the Lloyd's Register had the only comprehensive list of ships worldwide, each ship had its own, distinctive number

IMO-Number

In the year 1987 the IMO (International Maritime Organisation, a subsidiary organisation of the UNO, regulating the shipping industry) adopted Resolution A.600(15), to assign to each ship a "ship identification number". This became mandatory in 1996 and LR was assigned to continue to register and issue now the "IMO-number". Today the IMO-No. are assigned by IHS-Maritime, a subsidiary of Fairplay and Lloyds Register.

The IMO-No. of a ship remains from construction until demolition always the same, regardless of change of name, flag and/or ownership

The IMO-Number has to be displayed permanently on the stern and normally in way of the bridge.

Under the ship's name and homeport on the stern, today you have also the IMO-number (Photos: M. Eichmann)

Official Number

The number is assigned by the various national ship's registries. These numbers differ from country to country. In Switzerland a consecutive number,

starting from 1 is used, today reached 214 (April 2015) and Malta now has adopted the IMO-No. as their official number.

Call sign: The call sign is a sequence of four to seven letters and numbers for the international identification of a radio station on board a ship or aircraft. The first two digits are distributed by the ITU in Geneva (International Telecommunications Union) to the states in one or more groups. For Switzerland stands HB as the ITU-prefix. The remaining two letters are allocated by the Swiss Maritime Navigation Office in Basel. A Swiss ship for example has a call sign HBXY, meaning HB for Switzerland and XY to identify the ship.

Swisscom Broadcast operates on behalf of the Swiss Government the coastal radio station Bernradio (HEB) for radio communication by short waves, thereby ensuring continued radio communication between ships and Switzerland, even if satellite communications would break down.

Other nations, for example St. Vincent and the Grenadines have a call sign starting with J8A to J8Z, consisting of an alphanumerical group of five to seven digits.

Tonnage:

GRT / GT Gross Register Tons, has nothing to do with weight, but is a measure of the volume of the entire ship, including superstructure. In the old days one GRT was 100 cubic feet, or 2,8 m3.

With the "International Convention on Tonnage Measurements of Ships 1969" the procedures were simplified and since 1982 the GT Gross Tons are in force. Again it measures the volume of the ship, but in m3, then the figure is multiplied by factor reflecting the type of ship. In German language GT is called BRZ (Bruttoraumzahl).
Before the "International Convention on Tonnage Measurements of Ships 1969" was adopted, each country had its own tonnage rules, therefore tonnage used to change, when a ship was sold from one country to another.

NRT / NT The volume of the "freight earning compartments", such as cargo holds or cargo tanks. In German the NRZ (Nettoraumzahl).
GT and NT are used to calculate various fees and taxes.

Open shelter decker (OSD) This is an old tonnage class, given to the tweendeck cargo vessels. A vessel could have dual tonnage, open shelter decker and closed shelter decker. OSD was used for ships carrying low weight, but high volume cargoes, i.e. general cargo. With this tonnage, less deadweight and less draft was allowed, but also less harbour dues had to be paid.

Closed shelter decker (CSD) Contrary to above, the CSD could load more cargo and had a deeper draft, but also higher harbour dues had to be paid. This tonnage was suitable for heavy cargoes, i.e. grain, ore etc.

Many ships were measured for both OSD and CSD. Certainly older seafarers remember the "tonnage hatch". For the tonnage measurement, the tween deck was considered as "main deck"

and the main deck was considered as a "shelter". To maintain this fiction, the "tonnage hatch" was used, as it could not be permanently closed. Also "tonnage passage ways" were used alongside the engine casings. With these tricks, the tween deck became the main deck and the tonnage was reduced accordingly.

Alternatively, when the "tonnage hatch" and the "tonnage passage ways" were made watertight and permanently closed, then the ship became a closed shelter decker.

Displacement

The floating ship displaces an amount of water corresponding to its own weight (law of Archimedes). The displacement varies when the ship is loaded or discharged. Today given in metric tonnes, but in the old days frequently long tons (lt = 1016 kg) were used.

Light weight

The weight in tonnes of the empty ship with all the machinery and fixed equipment on board.
This figure is important, once the vessel is sold for demolition.

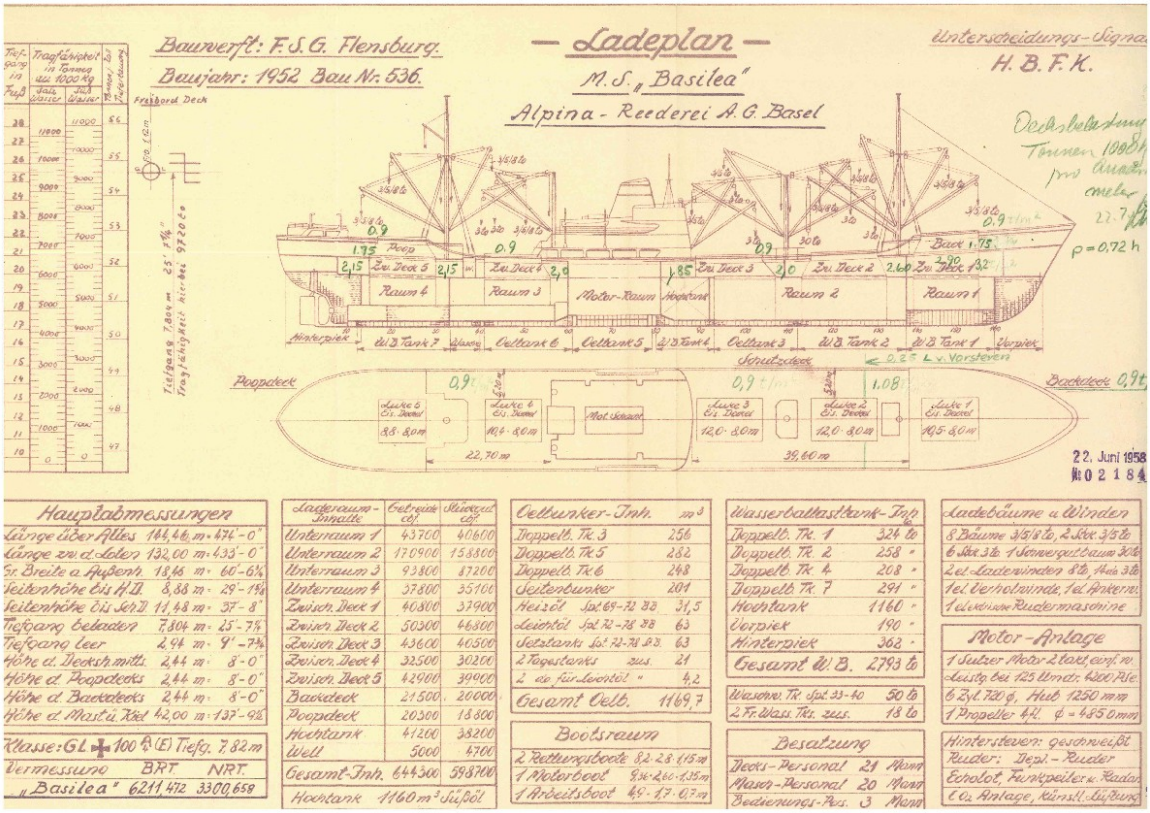
DWT

Dead Weight tonnes is the carrying capacity of the ship on its load line marks. It comprises the weight of cargo, bunkers, fresh water, stores and crew. For example, if a long voyage is undertaken, less cargo can be carried, because more bunkers are necessary and vice versa

Note: Lightweight + Deadweight = Displacement

DWT-scale

The shipbuilder prepares a list giving the displacement and the dead weight for each 1 dm (10 cm) or 1 foot, the so called "dead weight scale". This scale usually is incorporated in the "capacity plan" but can be drawn up separately.



In this loading plan (capacity plan) the "deadweight scale" is located in the left, upper corner.
From left, the draft in feet, then the deadweight in saltwater, then in freshwater.
On the right the tonnes, which can be loaded per one inch additional immersion on the corresponding draft (TPI = Tonnes per Inch).

Load-line marks

The load-line marks or "plimsoll-marks" were introduced by Samuel Plimsoll (1824 - 1898), a British MP, who pushed in 1876 a bill through parliament, which resulted in the Merchant Shipping Act. The idea was to prevent overloading of the ships and to have sufficient freeboard.

The load-line marks are assigned by a classification society and are marked permanently by welding mid ships on each side, whereas draft marks are placed on the stem, mid ships and on the stern.

Above the load-line and draft marks of a cargo vessel, BV denotes the class society assigning the load-line, in our case Bureau Veritas, Paris. S means summer line, W = winter and T = tropical, F = fresh water, TF = tropical fresh water
You see, in winter less can be loaded then in summer or in the tropics.

The DWT of a vessel usually is denominated as DWT on summer line. F and TF is the freshwater allowance (freshwater / tropical freshwater). Due to the difference of the density, a ship coming from the sea into freshwater (for example into a river) will go deeper down and vice versa. When Loading in a tropical river to the mark TF, the vessel will be lifted to mark T, when reaching the sea. In this way it will remain within the legal limit.

Load line zones

The seas and the oceans of the world are divided into various zones, i.e. the tropical zone, the summer zone and the winter zone. Some zones change according to the seasons. Ships have to be loaded in such a way, as to maintain the prescribed draft in any zones during a voyage, see below chart.

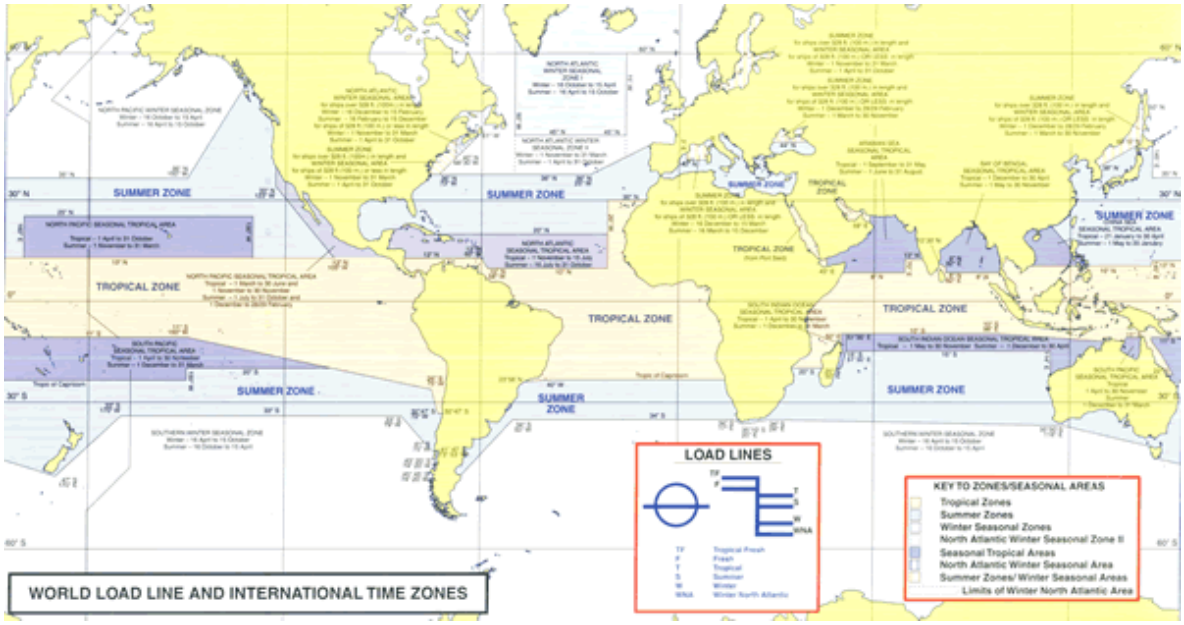


Chart of the worldwide "Load line Zones" (By courtesy of http://www.maritimesun.com/news/wp-content/uploads/2012/02/WORLD-LOADLINE-AND-INTERNATIONAL-TIME-ZONES.jpg **)**

Container:

TEU

TEU = Twenty Foot Equivalent Unit means a container of a length of 20 feet (6,06 m long x 2,44 m wide x 2,59 m high) and a total weight of 24 mt. Note, there are many differing containers, here we have given only the basic container unit.

Capacity of container ships are usually given in TEU.

FEU

FEU = Forty Foot Equivalent Unit, a container of 40 feet length (12.19 m long x 2,44 m wide x 2,59 m high).
Note, an articulated lorry normally carries 2 TEU or 1 FEU

Engine power:

HP

Horse Power:
The term "Horse Power" goes back to James Watt in the 18th. century, who first defined and introduced a measure for power. Today the more scientific term "Kilo watt" is used (kW):

1 HP = 0,736 kW
1 kW = 1,36 HP

BHP

Brake Horse Power:
The power measured on the test bed, using a water brake or a generator, giving the power at the output shaft of the engine.

IHP

Indicated Horse Power:
A theoretical figure, when measuring the steam or the gas pressure in a

cylinder to calculate the engine power. It does not take the internal friction of the engine into account.

NHP

Nominal Horse Power:
An old unit, mainly used for steam engines. This formula is very theoretical, as it was about 3-4 times less, then the actual horse power. It was also used to calculate survey fees (to the delight of the ship owners).

Reciprocating steam engines

These were built mainly as compound engines, meaning steam was used in two or more stages.

The most frequently used steam reciprocating engine was the triple expansion engine, using an HP, IP and LP cylinder (high, intermediate and low pressure). Sometimes also quadruple expansion engines were used.

T-3

In the old LR-books T-3 stood for "Triple expansion steam engine".

Steam turbines

Usually a HP and LP-turbine was used with one astern turbine (note, a turbine cannot run astern).

Various:

SWL

The load capacity of all lifting equipment used on board, is marked with SWL = Safe Working Load.

For example: SWL = 5,0 tons

SwissShips, HPS, April 2015