

# GLOSSARY

## TO ASSIST WITH SHIP SURVEYING



## Glossary

A selection of marine terms, to assist the Marine Surveyor when conducting inspections of ships for Charter purposes, is provided below.

<b>A</b>	
<b>ABAFT</b>	Towards the stern of a ship; behind; back-of; further aft than.
<b>ABEAM</b>	Abreast of; at right angles to.
<b>ABOARD</b>	On or in the ship / vessel.
<b>ABREAST</b>	Side-by-side; opposite to.
<b>ACCOMMODATION</b>	The part of the ship which is used for cabins, dining areas and other crew facilities.
<b>ACCOMMODATION LADDER</b>	The access ladder to the ship / vessel; one provided on each side of the vessel to provide safe access from the wharf or the sea.
<b>AFT</b>	Near or toward the stern.
<b>AFTER BODY</b>	The portion of a ship's structure aft of the midship section.
<b>AFTER FRAMES</b>	Frames aft of amidships or frames near the stern of the ship / vessel.
<b>AFTER PEAK</b>	The aftermost tank or compartment forward of the stern post. Usually serving as a fresh water tank and in certain cases, providing stern tube cooling. The after peak may also be utilized as a ballast tank.
<b>AFTER PERPENDICULAR</b>	A line perpendicular to the baseline intersecting the after edge of the stern post at the designed waterline. It is a vertical line passing through the point where the design waterline intersects the stern of the ship.
<b>ALOFT</b>	Above the deck; the top area of a mast.
<b>ALLEYWAY</b>	Any corridor aboard the vessel connecting one part of the accommodation to another part.
<b>AMIDSHIPS</b>	In the vicinity of the middle portion of a vessel, as distinguished from her ends. The term is used to convey the idea of general locality but not that of definite extent.
<b>ANCHOR</b>	A heavy cast iron or steel object attached to the vessel by means of heavy gauge chain utilized for the purpose of holding the vessel in position when afloat.
<b>ANCHOR CHAIN, ANCHOR CABLE</b>	A heavy chain used for holding a vessel at anchor. The total length of chain is to be divided in approximately equal parts between the two bow anchors. The inboard ends of the chain cables are to be secured to the ship's structure by means which enable, in case of emergency, an easy slipping of the chain cables to the sea.
<b>ANCHOR POCKET</b>	A recess in the bow plating large enough to accommodate the anchor so that there is no projection outside of the shell plating.
<b>ANTI-FOULING</b>	A type of paint coating that is resistant to marine growth (barnacles; marine grass; moss; seaweed; various other plant / animal life that would want to adhere to the vessel's hull and thus slow the speed through the water and/or cause damage to the hull).
<b>APPENDAGES</b>	Protrusions from the ship's main structure – i.e. extending beyond the vessels' main outline and may include items such as bilge keels, propellers, rudders, and other features.
<b>APRON</b>	A timber fitted abaft the stem to re-inforce the stem and give a sufficient surface on which to land the hoot ends of the planks.
<b>ASTERN</b>	Indicating a position in the rear or abaft the stern; the opposite of going ahead; backwards.
<b>ATHWART</b>	Across- from side to side
<b>ATHWARTSHIP</b>	Reaching across the vessel, from side to side.

**AUXILIARIES**

Various items of machinery other than the main propulsion machinery, which could include winches, pumps, motors, power generators, boilers, etc.

**AWNING**

A canopy or roof made of canvas or other material such as corrugated fiberglass sheeting, which has been suspended above a vessel's deck or over bridge wings for protection against the sun and weather.

**B**

**BACKSTAY**

Wire support stays which extend from mast level to ship's side at some distance abaft the mast; serving as additional support to prevent a mast going forward and to contribute to the lateral support.

**BAFFLE**

A plate or structure placed in the line of flow of fluids or gasses to direct the flow in order to obtain greater contact with heating or cooling surfaces.

**BALANCED RUDDER**

A rudder with its axis between the forward and after edge.

**BALK**

A piece of heavy gauge square cross-sectional timber.

**BALE CAPACITY; BALE CUBIC**

The cubic capacity of a cargo hold measured to the inside of the frames or cargo battens.

**BALLAST**

Any form of weight (solid or liquid) carried aboard a vessel solely for the purpose of making the vessel stable and seaworthy. Ballast may either be portable or fixed, depending upon the condition of the vessel.

Fixed or permanent ballast can be in the form of sand in bags, solid concrete, lead ingots, scrap steel or pig-iron. Permanent ballast is usually introduced into the vessel to overcome an inherent defect in stability or trim due to faulty design or changed character of service.

Portable ballast, usually in the form of water pumped in or out of the double bottom, peak or wing ballast tanks, is utilized to overcome a temporary condition in the vessel's stability or trim, as effected by the type of cargo and the cargo quantity or position within the vessel.

**BALLAST TANKS**

These are tanks provided within the structure of the vessel for introducing water ballast, when necessary, to add weight to alter the change in trim or in stability of the ship. Ballast tanks are usually in the form of "double bottom" constructed below the cargo compartments and at the peaks – fore peak and/or after peak, as well as wing tanks constructed at the ship's sides or topside tanks (Bulk Carriers) fitted at the main deck level on outboard sides to improve stability conditions when the vessel is sailing in a ballasted condition.

**BALLAST WATER**

Ballast water is usually sea water, which is pumped into double bottom, peak, wing, topside or other designed tanks, in order to obtain satisfactory conditions for trim and stability.

**BALLASTED CONDITION**

When a ship is referred to as being in a "ballasted condition", it is normally void of cargo (empty) and ballast water has been introduced into the various ballast tanks or compartments to increase the light draught and provide a suitable stabilized condition for proceeding to sea without being fully laden.

<b>BATTEN</b>	<p>When referred to as a “cargo batten”, these are long sections of timber either of rectangular or square cross-sectional configuration, placed horizontally over ship’s side frames to provide protection between cargo and the ship’s structure.</p> <p>When referred to with respect to “hatch covers”, long flat bar steel battens are utilized for securing of the hatch board / pontoon and tarpaulin type hatch covers, which have now been superseded by steel folding type covers (Macgregor type) or large steel pontoons, which are fitted with rubber insert gaskets for watertight integrity.</p>
<b>BATTENS, CARGO</b>	<p>A term applied to the wooden planks or steel shapes that are fitted over ship’s side frames in a cargo hold to prevent cargo from making direct contact with the steel structure; additionally, lengths of timber utilized to prevent shifting of cargo.</p>
<b>BARE BOAT CHARTER</b>	<p>A Charter in which the bare ship is chartered without crew. The Charterer for a stipulated sum takes over the vessel for a stated period of time, with a minimum of restrictions. The Charterer appoints the Master and crew and pays all the running expenses.</p>
<b>BARNACLE</b>	<p>A small, primitive sea animal with a calcareous shell which, in its adult form, lives attached to some alien object, such as a ship’s hull, wharf piles, and the like.</p>
<b>BASE LINE</b>	<p>A horizontal line drawn along the top edge of the keel from midship.</p>
<b>BEAM</b>	<p>The extreme width of a ship. Also an athwartship or longitudinal member of the ship’s structure supporting the deck.</p>
<b>BEAM KNEE</b>	<p>A bracket between frames or stiffeners and the end of a beam; a beam arm.</p>
<b>BEAM LINE</b>	<p>A line showing the points of intersection between the top edge of the beam and the molded frame line, also called “molded deck line”.</p>
<b>BEAM, PLATE ANGLE</b>	<p>A beam made from a flat plate with the flange bent at right angles at one end to introduce strength.</p>
<b>BEARER</b>	<p>A term applied to foundations, particularly those having vertical web plates as principle members. The vertical web plates of foundations are also referred to as “bearers”.</p>
<b>BEARING</b>	<p>A block on or in which a journal rotates; a bearing-block.</p>
<b>BELL</b>	<p>With regard to “pipe fitting”, the bell is the recessed or enlarged female end of a pipe into which the male end of the next pipe fits.</p>
<b>BELL MOUTHED</b>	<p>A term used to describe or signify the open end of a vessel or pipe when it expands or spreads out with an increasing diameter, thus resembling a bell.</p>
<b>BELOW</b>	<p>Underneath the surface of the water or underneath a deck or decks – i.e. “<i>below decks</i>”.</p>
<b>BERTH, ABOARD A VESSEL</b>	<p>A term applied to a bed or a place to sleep. Berths, as a rule, are permanently built into the structure of the accommodation and can be of singular construction or in several tiers (two or three), one above the other. When single, drawers for stowing clothing are often built underneath. Tiers of berths constructed of pipe are common installed in crew spaces.</p>
<b>BERTH, AT A PORT BETWEEN DECKS</b>	<p>A location within a port where a ship can moor.</p> <p>This is the space between two or more horizontal decks and is frequently referred to as “Tween Decks”.</p>

<b>BEVEL</b>	A term for a steel plate having any other angle than 90° to the horizontal plane. May also be a small tool, which is similar to a tri-square, except that the blade is adjustable to take “bevels”.
<b>BEVEL, CLOSED</b>	A term applied where one flange of a steel bar is bent to form an acute angle with the other flange.
<b>BEVEL, OPEN</b>	A term applied where one flange of a steel bar is bent to form an obtuse angle with the other flange. Ship’s frame bars, in the bow and the stern of a vessel, are given an open bevel to permit access for riveting to shell and to keep the standing flange parallel to the deck beams.
<b>BILGE</b>	The rounded portion of a vessel’s shell, which connects the bottom with the side.
<b>BILGE PLATES</b>	The curved shell plating that takes the turn between the side vertical and bottom horizontal plating.
<b>BILGES</b>	The lowest portion of a ship within the hull structure, considering the inner bottom where fitted as the bottom hull limit. Also known in modern construction as the drainage wells, which water would divert to from where the water can be pumped overboard or into a holding tank.
<b>BILGE WELL</b>	A sump to which bilge water drains. It is important to arrange bilge wells in a way enabling permanent access and possibility of cleaning even when holds are loaded.
<b>BILGE KEEL</b>	A steel flat bar structure usually with a bulb end, welded to the bilge plate at the turn of the bilge externally on the hull structure. Bilge keels assist in stabilizing a vessel.
<b>BINNACLE</b>	The stand for housing a Standard Magnetic Compass.
<b>BITTER END</b>	The inboard end of the ship’s anchor chain, which is secured within the chain locker.
<b>BITTS</b>	This term is applied to short cylindrical cast steel columns, which extend up from a base plate, securely attached to a deck or a bulwark rail for the purpose of securing and belaying ropes, hawsers, cables, etc. When fitted on a pier or wharf, they are referred to as “bollards”.
<b>BLISTER</b>	A raised area, often dome shaped, resulting from loss of adhesion between a coating or deposit and the substrate.
<b>BLISTERING</b>	The formation of blisters in a paint film by localized loss of adhesion and lifting of the film. Blisters may contain liquid, vapor or gas.
<b>BLOCK</b>	The term given to a pulley or sheave, or a system of pulleys / sheaves, mounted in a frame or shell used for moving objects by means of ropes or wire reeved through these pulleys or sheaves. There are various types – some have a single or double or triple sheave configuration. The main and principle parts of a “block” are: <ul style="list-style-type: none"> <li>• The shell / outer frame</li> <li>• The sheave (or sheaves) around which the rope or wire runs</li> <li>• The pin around which the sheave turns</li> <li>• The strap from which the cargo hook is held in position as well as providing the bearing for the pin</li> <li>• The hook which may be an open, shackle or fixed swivel type</li> </ul> The opening between the top of the sheave and the shell is called the “ <i>swallow</i> ”; the opening between the bottom of the sheave and the shell is called the “ <i>breach</i> ”; the device attached to the bottom of the block, opposite the hook, for securing the standing part of the fall or structure to the block, is called the “ <i>becket</i> ”.
<b>BLOCK, SNATCH</b>	This is a single sheave block, which has one side of the frame “ <i>hinged</i> ” so that it can be open to allow the bite of a rope or wire to be placed onto the sheave, thus avoiding the necessity of threading / reeving the end of

	the rope through the swallow of the block. This type of block is usually employed as a " <i>fair-lead</i> " around obstructions.
<b>BLOWER</b>	A mechanical device used to supply air under low pressure for artificial ventilation and forced draft, usually of the centrifugal type.
<b>BOARDING</b>	The act of going on board a ship.
<b>BOARDING ARRANGEMENTS, BOARDING FACILITIES</b>	All gear, such as pilot ladders, accommodation ladder, mechanical hoists, gangways, ramps, shell doors, etc., necessary for the safe transfer of the Pilot / personnel to/from the ship.
<b>BOAT CHOCK</b>	A cradle or support for a lifeboat.
<b>BOAT FALL, BOAT TACKLE FALL, DAVIT FALL</b>	The ropes by which the ship's boats are lowered or hoisted – may be synthetic rope or wire.
<b>BOAT WINCH</b>	An electric winch for handling a lifeboat.
<b>BOLLARD</b>	A rectangular base welded to the deck of the ship, upon which two vertical bits are welded. Bollards are used to secure the mooring lines. Also refer to "Bits".
<b>BOLT</b>	A metal rod used as a fastening device, having a head or shoulder at one end and a screw thread to carry a nut over the remainder of the shaft.
<b>BONNET</b>	A cover used to guide and enclose the tail end of a valve spindle.
<b>BOOBY HATCH</b>	An access hatch from a weather deck, protected by a coaming from the sea and weather. The coaming structure is often fitted with a watertight lid.
<b>BOOM</b>	A long round spar hinged at its lower end, usually to a mast, and supported by a wire rope or tackle from aloft to the upper end of the boom. Cargo, stores, etc., are lifted by tackle leading from the upper end of the boom.
<b>BOOT TOP, BOOT TOPPING</b>	The surface of the outside plating between the light and load waterlines. It is the hull area which is most exposed to corrosion.
<b>BOSS, STERN FRAME</b>	The curved, swelling portion of the ship's underwater hull around the propeller shaft.
<b>BOSS HUB</b>	The central portion of a propeller to which the blades are attached and through which the shaft end passes.
<b>BOSS PLATE</b>	The plate which covers the boss.
<b>BOTTOM</b>	That portion of a vessel's shell between the keel plate and the lower turn of the bilge at the sides.
<b>BOTTOM, OUTER</b>	A term referring to the bottom shell plating in a double bottom configuration.
<b>BOTTOM PLATING</b>	That part of the shell plating which is below the waterline, more specifically, the immersed shell plating from bilge to bilge.
<b>BOTTOM SHELL</b>	The shell envelope plating forming the predominantly flat bottom portion of the shell envelope including the keel plate.
<b>BOW</b>	The forward end of the ship; the sides of the vessel at, and for the same distance, abaft the stern, designated as the right-hand or starboard bow and the left-hand or port bow.
<b>BOW FLARE</b>	The spreading out of the fore-body form from the central vertical plane, increasing rapidly as it rises from the waterline to the rail.

**BOW LINES**

Curves representing vertical sections parallel to the central longitudinal vertical plane of the bow end of a ship. Similar curves in the after part of the hull are called “*buttock*” lines. Also, a rope leading from the vessel’s bow to another vessel or to a wharf for the purpose of hauling the vessel ahead or for securing her at a mooring.

**BOW SPRITE**

A spar projecting forward over the bow for the purpose of holding the lower ends of the head sails.

**BOW THRUSTER**

A lateral thruster fitted in an athwartship tunnel near the bow to improve maneuverability.

**BOX GIRDER**

A hollow girder or beam with a square or rectangular cross section.

**BRACE**

A rope attached to the yard arm, used to alter the position of the yard arm in a horizontal plane. The operation is known as “*trimming the sail*”.

**BRACKET**

A steel plate, usually of triangular shape with a reinforcing flange on its free edge, used to connect two parts such as deck beams to frames, frame to margin plate, etc. Also used to stiffen or tie beam angles to bulkheads and frames to longitudinals, etc. **Backing bracket**

A bracket added in order to provide additional support to a member on the opposite side of an existing bracket.

**Beam bracket**

A bracket attached at the end of a beam in order to provide continuity of load distribution, stress reduction through the use of an effective web of increasing width, thus avoiding the formation of stress concentrations.

**Docking bracket**

A bracket located in the double bottom to strengthen the bottom structure locally for the purpose of docking (Dry Docking).

**Tripping bracket**

A bracket used to strengthen a structural member under compression, against torsional forces.

**BRAISING**

The joining of certain metals by the use of a hard solder.

**BREADTH, EXTREME**

The maximum breadth measured over plating or planking, including beading or fenders, i.e. the maximum breadth of a vessel.

**BREADTH, MOULDED**

The greatest breadth of a vessel measured from the heel frame on one side to the heel frame on the other side.

**BREADTH, REGISTERED**

Measured amidships at its greatest breadth to the outside of plating.

**BREAK OF FORECASTLE or POOP**

The point at which the partial decks known as the forecastle and poop are discontinued, i.e. where the forecastle deck “breaks” down to the main deck level; where the poop deck rises from the main deck.

**BREAKWATER**

A heavy steel structure fitted on the forward weather deck, usually abaft the forecastle deck, to form a shield against water that is shipped over the bow and to disperse to the sides preventing the water from making contact with the main deck or cargo stowed thereon. Usually of an angled or “V-shaped” structure.

**BREAST HOOK**

A triangular shaped plate fitted parallel to and between decks or side stringers in the bow for the purpose of rigidly fastening together the peak frames, stem and outside plating; also used in conjunction with the above duties to fasten the ends of side stringers firmly together.

<b>BRIDGE</b>	<p>An elevated transverse platform, often forming the top of a bridge house, extending from side to side of a ship and from which a good view of the weather deck may be had.</p> <p>Also referred to as the “enclosed space” constructed above the accommodation superstructure at the forward end, which houses the navigation instruments, steering apparatus and from where the ship’s Officers navigate.</p>
<b>BRIDGE HOUSE</b>	<p>The superstructure fitted above the accommodation superstructure at the forward end from where ship’s Officers navigate the vessel.</p>
<b>BRIDGE, NAVIGATING or FLYING</b>	<p>The uppermost platform above the top of the bridge house structure and is also commonly referred to as the “<i>Monkey Island</i>”. Usually, this uppermost deck above the bridge houses the Standard Magnetic Compass, signal mast, radar mast and communication aerials.</p>
<b>BRIDGE WINGS</b>	<p>Those parts of the bridge on both sides of the ship’s wheelhouse that, in general, extend to the ship’s side.</p>
<b>BROKEN BACKED</b>	<p>Reference to a vessel when, owing to insufficient longitudinal strength, grounding or any other accident, her sheer reduced or lost, thereby producing a drooping effect at both ends.</p>
<b>BROW</b>	<p>A gangplank, usually fitted with rollers at the end that rests on the wharf, to allow for movement of the vessel with respect to the tidal conditions.</p>
<b>BUCKLE</b>	<p>Distortion in a steel structure such as a bulge; bent “<i>out-of</i>” original plane; to become distorted.</p>
<b>BUCKLER</b>	<p>Reference to various devices used to prevent water from entering ports, anchor hawse and/or spurling pipes, etc.</p>
<b>BUCKLING</b>	<p>The departure of a plate, shape or stanchion from its original designed plane or axis when subjected to load or to strains / stress introduced during fabrication, thereby reducing its ability to carry loads.</p>
<b>BULB PROFILE</b>	<p>A stiffener utilizing an increase in steel mass on the outer end of the web instead of a separate flange.</p>
<b>BULKHEAD</b>	<p>Reference to the transverse structural partition sub-dividing the interior of a ship into compartments / spaces. The various types of bulkheads are distinguished by the addition of a word or words, explaining the location, use, kind of material or method of fabrication, such as fore peak, longitudinal, transverse, watertight, wire mesh, pilaster, etc. Bulkheads which contribute to the strength and seaworthiness of the vessel are called “<i>Strengthened Bulkheads</i>”, those which are essential to the watertight sub-division are “<i>Watertight</i>” or “<i>Oiltight</i>” bulkheads. Additionally, there is also reference to “<i>Gastight</i>” and “<i>Fumetight</i>” bulkheads which serve to prevent gas or fumes from leaving or entering certain parts of a vessel.</p>
<b>BULKHEAD DECK</b>	<p>The uppermost deck up to which the transverse watertight bulkheads and shell are carried.</p>
<b>BULKHEAD DOORS</b>	<p>Access doors or flood prevention doors. A wide variety of designs and configurations are available; side-hinged door, sliding door, upward rolling door, and top-hinged door.</p>
<b>BULKHEAD, AFTER PEAK</b>	<p>Reference to the first transverse bulkhead forward of the stern post. This bulkhead forms the forward boundary of the after peak tank and is a “<i>Watertight</i>” bulkhead.</p>



<b>BULKHEAD, COLLISION</b>	This is the foremost transverse bulkhead in the ship's structure, which extends from the bottom of the shell to the freeboard deck. It is designed to keep water out of the forward hold in case of collision damage. This bulkhead is usually the after transverse bulkhead of the fore peak tank.
<b>BULKHEAD STIFFENER</b>	Structural members attached to the steel plating of a bulkhead for the purpose of strengthening it when pressure is applied from one side. The stiffener is generally fitted in the vertical plane but there are certain configurations of design where horizontal stiffeners are applied. The most efficient type of stiffener is that of the " <i>T-section</i> " or " <i>bulb-bar</i> " type but may also be of various steel profile sections such as flat bar, angles, channels, H and/or I sections.
<b>BULKHEAD, SWASH</b>	A strong structure of non-tight bulkhead design fitted in oil or water tanks to slow down the motion of the fluid set up by the motion of the ship.
<b>BULKHEAD, WIRE MESH</b>	A partitioned bulkhead usually found to enclose store rooms, workshops, etc. – constructed of wire mesh panels strengthened by angle bar structural frames.
<b>BULWARK</b>	This is the term referring to the strake of shell plating or the side structure above the weather deck. It serves as a safety structure to guard against losing deck cargo or men overboard. It assists, to a certain degree, in keeping the weather deck reasonably dry and in certain cases, is fitted with " <i>freeing ports</i> ", which allow water that breaks over the structure, to clear and run-off from the deck.
<b>BULWARK STAY</b>	This is a brace or support which attaches the bulwark structure to the main deck. These " <i>stays</i> " are constructed of flat plating and strengthened by an outer flat bar welded at 90° to the web of the stay. They are fitted at regular pitch intervals along the length of the deck to provide rigid support to the bulwark plating. They are fitted on the inboard side of the bulwark.
<b>BUNKER, TANK</b>	A tank compartment utilized for the storage of fuel – heavy or diesel oil.
<b>BUOYANCY</b>	The ability to float; the supporting effort exerted by a liquid (usually water) upon the surface of a body, wholly or partially immersed in it.
<b>BUOYANCY, RESERVE</b>	The floating or buoyant power of the unsubmerged portion of the hull of a vessel.
<b>BUTT</b>	That end or edge of a steel plate where it fits squarely against another piece or at the join formed between two plates.
<b>BUTTOCK</b>	The rounded-in overhanging part on each side of the stern in front of the rudder, merging underneath the run.
<b>BUTTOCK LINES</b>	The curves shown by taking vertical longitudinal sections of the after part of a ship's hull parallel to the ship's keel. Similar curves in the forward part of the hull are " <i>Bow Lines</i> ".
<b>BUTT STRAP</b>	A term applied to a strip of plate serving as a connecting strap between butted ends of plating. The strap connections at the edge are called seam straps.

## C

<b>CABIN</b>	Constructed within the accommodation superstructure to provide accommodation for Officers and/or Passengers.
<b>CABLE</b>	<ol style="list-style-type: none"><li>1. A rope or chain connecting a vessel to the anchor;</li><li>2. Wire or rope primarily used for mooring a ship;</li><li>3. 100 fathoms or 1/10 of a nautical mile.</li></ol>
<b>CAM</b>	A shaped projection on a rotating shaft which imparts a motion, usually linear, to a follower.
<b>CAMBER</b>	The curvature of the deck in a transverse direction. Camber is measured between the deck height at the center and the deck height at the side.
<b>CAMBER, ROUND OF BEAM</b>	The main / weather decks of ships are constructed such that they are rounded up or arched in an athwartship direction for the purpose of draining any water that may fall on them to the sides of the ship where the water can be lead overboard through scuppers or freeing-ports at the bulwarks. The arching or rounding-up is called " <i>The Camber</i> " or " <i>Round of the Beam</i> ".
<b>CANT</b>	A term signifying an inclination of an object from a perpendicular; to turn anything so that it does not stand perpendicular or square to a given object, i.e. " <i>to cant</i> ".
<b>CANT FRAME</b>	A frame that the plane of which is not square to the keel.
<b>CAPACITY OF VESSEL</b>	The capacity of the vessel can be measured in many ways, depending upon the type of vessel. Capacity of traditional cargo vessels as bale capacity or grain capacity. <b>Bale cubic capacity</b> The space available for the loading of cargo extending to the inside of the cargo battens on the frames and to the underside of the beams. <b>Grain cubic capacity</b> Maximum space available for cargo extending from the inside of the shell plating to the underside of the deck plating.
<b>CAPPING</b>	The " <i>fore and aft</i> " finishing piece fitted on top of a bulwark structure – i.e. " <i>the bulwark capping</i> ".
<b>CAPSTAN</b>	A vertical cylindrical drum or barrel type winch for winching mooring ropes and/or assisting with tensioning of wire rope hawsers and the like.
<b>CARGO</b>	Items of merchandise or goods accepted on board for transportation by the ship.
<b>CARGO BOOM</b>	Refer to " <b>BOOM</b> ".
<b>CARGO CRANES</b>	Shipboard cranes of various types and capacities are still required for multi-purpose cargo vessels, geared bulk carriers, feeders, reefers, heavy lift vessels and some forest product carriers.
<b>CARGO HATCH</b>	The opening in the main deck serving a cargo hold which is constructed of a strengthened coaming on top of which are fitted the hatch covers. The cargo hatch provides access into the cargo compartment and is the opening through which cargo is loaded into that compartment.
<b>CARGO RESIDUES</b>	Remains of any cargo on board that cannot be placed in proper cargo holds (loading excess and spillage) or which is left in cargo holds and elsewhere after unloading procedures are completed (unloading residual and spillage).
<b>CARLINGS</b>	Supports usually of flat plate, welded in a fore and aft direction between transverse deck beams to prevent distortion of the plating.
<b>CASING</b>	The covering or bulkheads enclosing portions of the vessel, for example, the Boiler and/or Engine Room casing.
<b>CATENARY</b>	The curve produced by a uniform, flexible wire or chain when suspended by its ends. Anchor chains from a buoy or towing wire between vessels will take this shape. It provides resilience to any sudden stresses.

<b>CATHODE</b>	The negatively charged metal surface and the non-corroding protected part of an electro-mechanical corrosion cell.
<b>CATHODIC PROTECTION</b>	Cathodic protection is a system of preventing corrosion by forcing all surfaces of a structure (e.g. hull) to be cathodes by providing external anodes. It can be achieved by superimposing on the hull and impressed current provided by a remote power source through a small number of inert anodes ( <i>impressed current cathodic protection</i> ). Also accomplished by fitted aluminium, magnesium or zinc anodes in tanks or underwater portion of a ship, which waste away by galvanic action ( <i>sacrificial anode cathodic protection</i> ).
<b>CATWALK; WALKWAY</b>	A narrow, raised platform or pathway used for passage to otherwise inaccessible areas on a ship, permitting fore and aft passage when the main deck is awash.
<b>CAULKING</b>	Plastic deformation of weld and base material surfaces by mechanical means to seal or obscure discontinuities.
<b>CAVITATION EROSION</b>	The erosion of metal, for example, the back-side of the propeller blades, usually attributed to the collapse of cavitation bubbles.
<b>CEILING</b>	The term applied to the timber planking attached to bulkheads to provide a form of sheathing and/or insulation.
<b>CEILING, FLOOR</b>	Timber planking fitted in way of the hatch square area on the tank top of a cargo compartment to provide additional protection where cargo is landed.
<b>CENTRELINE</b>	The longitudinal axis through the middle of the vessel extending from stem to stern.
<b>CHAFING</b>	The action of being fretted and worn by rubbing; applies to ropes, parts of the ship's structure, cargo, etc.
<b>CHAFING GEAR</b>	A type of guard made up of canvas or rope, which is fitted around spars, mooring ropes / lines or rigging to prevent them from wearing out by rubbing against something.
<b>CHAFING PLATE</b>	A plate fitted to take the wear due to dragging / moving gear or protect ropes from wearing where they rub on sharp edges. Also fitted on decks under anchor chains.
<b>CHAIN</b>	Connected metal rings or links used for holding an anchor, fastening timber cargoes, etc.
<b>CHAIN LOCKER</b>	A compartment located under the windlass where the anchor chains are stowed. It is usually subdivided inside by a longitudinal bulkhead. The chain locker is made watertight to the weather deck.
<b>CHAIN PIPE</b>	A heavy pipe fitted directly under the windlass to lead the anchor chain to the chain locker.
<b>CHAIN STOPPER, CABLE STOPPER</b>	A fitting used to secure the anchor chain when riding at anchor, thereby relieving the strain on the windlass, and also for securing the anchor in the housed position in the hawse pipe. A chain stopper usually consists of two parallel vertical plates mounted on a base with a pivoting bar or pawl, which drops down to bear on a chain link.
<b>CHALKING</b>	The formation of a sandy, powdery layer on the surface of a paint film caused by disintegration of one or more components of the film due to weather and sunlight (ultraviolet radiation).
<b>CHANNEL BAR</b>	A rolled bar with a "U" shaped cross-section.
<b>CHARTER PARTY</b>	A written contract between the Owner of a vessel and the person desiring to employ the vessel (Charter), setting forth the terms of arrangements, freight rate and ports involved.
<b>CHECK VALVE</b>	A valve which permits the flow of liquid in only one direction, i.e. a non-return valve.

<b>CHEQUERED PLATE</b>	A plate used as floor, marked with raised diamond squares to provide good footing. Also known as “non-slip” plate.
<b>CHERRY PICKER</b>	Equipment fitted with a hydraulic arm to enable Inspectors and workers to approach inaccessible areas of a structure.
<b>CHINE</b>	A sharp edged bend in a ship’s hull plating.
<b>CHOCK</b>	A guide for a mooring line, or steel towing wire which enables the line to pass through a ship’s bulwark or other barrier. Also refer to “Fairlead”.
<b>CLADDING</b>	A coating applied to a material, e.g. a stainless steel coating bonded onto mild steel.
<b>CLASS</b>	Classification symbols and associated marks and notations assigned to a vessel by a Classification Society, depending on the design of the vessel, the quality of the materials employed, the scantlings of the various structural members and the outfit and equipment, all of which should be up to the standards specified by the Class Society Rules. Each Classification Society has its own way of recording the construction details of a ship, which are finally entered on the Certificate of Class and in the Register Book. The validity of the assigned Class is conditioned upon due to compliance with the requirements regarding maintenance of Class.
<b>CLASS NOTATION</b>	The certification details of a ship’s hull or machinery using particular terms or abbreviations, e.g. Oil Tanker, UMS (Unattended Machinery Space), etc.
<b>CLEADING</b>	A covering used to prevent the radiation or conduction of heat, e.g. boiler casing.
<b>CLEATS</b>	A metal fitting, usually of cast steel, having two projecting arms or horns upon which to belay ropes.
<b>CLENCH PIN</b>	A pin that secures the final link of the anchor chain to the ship’s structure within the chain locker. Removal of this pin enable an emergency release of the anchor and chain.
<b>CLINOMETER</b>	An instrument used for indicating the angle of roll or pitch of a vessel.
<b>CLOSE-UP SURVEY</b>	A survey where the details of the structural components are within the close visual inspection range of the Surveyor, i.e. preferably within reach of hand.
<b>CLOSING APPLIANCE</b>	Any cover or other item functioning as a cover for an opening in the shell, deck or bulkhead.
<b>CLUTCH</b>	A device to connect, or disconnect, a driving unit to the unit it drives.
<b>COAMING, BULKHEAD</b>	A term applied to the top and bottom strakes of bulkheads, which are usually made thicker than the remainder of the plating and which act as girder web plates in helping to support the adjacent structure.
<b>COAMING, HATCH</b>	A frame bounding a hatch for the purpose of stiffening the edges of the opening and forming the support for the hatch covers. A steel structure having flush plating internally in way of the opening and fitted externally around the peripheral by vertical brackets or stays which connects to the main deck.
<b>COAMING, MANHOLE</b>	The frame worked around a manhole to stiffen the edges of the plating around the opening and to provide a support for the cover.
<b>COCK</b>	A valve which is opened or closed by giving a disk or a tapered plug a quarter turn.
<b>COFFERDAM</b>	Void or empty spaces separating two or more compartments for the purpose of insulation or to prevent the liquid contents of one compartment from entering another in the event of the failure of the walls of one to retain their tightness. Usually constructed between water and fuel oil tanks.

<b>COLLAR</b>	A piece of plate or a shape fitted around an opening for the passage of a continuous member through a deck, bulkhead or other structure to secure tightness against oil, water, air, dust, etc.
<b>COMPANIONWAY</b>	A hatchway or opening in a deck provided with a set of steps or ladders leading from one deck level to another for the use of personnel.
<b>COMPARTMENT</b>	A sub-division of a space or a room within a ship. An internal space separated by bulkheads or plating.
<b>COMPARTMENTATION</b>	The subdividing of the hull by transverse watertight bulkheads so that the ship may remain afloat under some conditions of flooding.
<b>COMPASS</b>	This is the most important for navigation aboard a ship. There are two types aboard a ship – a Standard Magnetic Compass and a Gyroscope. The Magnetic Compass is actuated by the earth's magnetism whilst the Gyro Compass is actuated by the property of a rapidly rotating body by which, when it is free to move in different directions, tends to place its axis parallel to the earth's axis, that is, North and South.
<b>COMPRESSION BAR</b>	A steel bar fitted on hatch coaming upper plate against the seal, providing a weather-tight joint.
<b>CORDAGE</b>	A comprehensive term for all ropes of whatever size or kind aboard a ship.
<b>COTTER, KEY</b>	A solid key or wedge used to secure a wheel on a shaft.
<b>COTTER, SPRING</b>	A round split-pin used to lock a nut on a bolt. The pin is passed through a hole in the bolt outside of the nut and the ends of the pin, opposite its heads, are forced apart by a chisel or similar tool, thus preventing the cotter from slipping out.
<b>COUNTER</b>	That part of a ship's stern which overhands the stern post, usually that part above the waterline.
<b>COUPLING</b>	A device for securing together the adjoining ends of piping or shafts, etc. The most common type of flanges, which are fitted at the ends of the pipes, are butted together and secured in place by bolts.
<b>CRADLE</b>	A support structure made of timber or steel, shaped to fit the object which is stowed upon it.
<b>CRANES</b>	Hoisting devices used for cargo handling and other operation. Cranes are required to hoist, luff and slew. Separate motors are required for each motion.
<b>CRANE CHARACTERISTICS</b>	Parameters such as lifting capacity, maximum working radius, minimum working radius, hoisting speed, luffing time, slewing speed, slewing angle and weight.
<b>CROSS DECK</b>	The area between cargo hatches.
<b>CRUTCH</b>	A term applied to a support for a derrick boom or crane jib when stowed and not in use.

## D

<b>DAVIT</b>	A device used to lower and raise ship's boats and sometimes for other purposes. The rotary, or most common type, consists of a vertical pillar, generally circular in section, with the upper portion bent in a fair curve and having sufficient outreach to clear the side of the ship plus a clearance. Each ship's boat has two davits, one near its bow and one near its stern; they both rotate, lifting the boat, by means of blocks and falls suspended from the overhanging end, from its stowage position on deck and swinging it clear of the ship's side. This type of davit is usually stepped in a socket attached to the side of the vessel or on the deck next below the boat deck near the side and held in place at the boat deck by a keeper or bearing.
<b>DEADLIGHT</b>	Applied to a port lid or cover; a metal shutter fitted to protect the glass in a fixed or port light. Often incorrectly applied to a fixed light in a deck, bulkhead or shell.
<b>DEADWEIGHT (DWT)</b>	The difference between the light displacement and the full load displacement of a vessel; the total weight of cargo, fuel, water, stores, passengers, and crew and their effects that a ship can carry when at her maximum allowable draught.
<b>DECK</b>	A deck in a ship corresponds to a floor in a building. It is the plating, planking, or covering of any tier of beams above the inner bottom forming a floor, either in the hull or superstructure of a ship.
<b>DECK BEAM</b>	Athwartship element of a vessel's structure, which supports deck plating and which acts as a strut or tie connecting the vessel's sides.
<b>DECK BOLT</b>	A special type of bolt used to secure the planks of a wood deck to the frames or deck plating.
<b>DECK, BULKHEAD</b>	The upper most continuous deck to which all main transverse bulkheads are carried. This deck should be watertight to prevent flooding adjacent compartments if a compartment is bilged.
<b>DECK, FREEBOARD</b>	The deck to which the classification societies require the vessel's freeboard to be measured. Usually the upper strength deck.
<b>DECK GIRDER</b>	A continuous girder running in and fore-and-aft direction on the underside of deck beams.
<b>DECK HEIGHTS</b>	The vertical distance between the molded lines of two adjacent decks.
<b>DECK HOUSE</b>	A term applied to a partial superstructure that does not extend from side to side of a vessel as do the bridge, poop and forecastle.
<b>DECK LINE</b>	See "Beam line".
<b>DECK MACHINERY</b>	A term applied to capstans, windlasses, winches, and miscellaneous machinery located on the deck of a ship.
<b>DECK PLANKS, PLANKING</b>	<b>or</b> A term applied to the wood sheathing or covering on a deck. Oregon pine, yellow pine, and teak are most commonly used. The seams between the planks should be thoroughly caulked.
<b>DECK PLATING</b>	A term applied to the steel plating of a deck.
<b>DECK SEAL</b>	A non-return valve arrangement to prevent the back-flow of flammable gases, from cargo tanks, into an inert gas plant.
<b>DECK STRINGER</b>	The strake of deck plating that runs along the outboard edge of a deck.
<b>DECKHOUSE</b>	An enclosed erection on or above the weather deck that does not extend from side to side of the ship.

<b>DECK, TURTLE</b>	A term applied to a weather deck that is rounded over from the shell of the ship so that it has a shape similar to the back of a turtle. Used on ships of the whaleback type and on the forward weather deck of torpedo boats.
<b>DECK, WEATHER DEEP FLOORS</b>	Uppermost continuous deck with no overhead protection.
<b>DEEP TANKS</b>	A term applied to the floors of the ends of a ship which are deeper than the standard depth of floor at amidships.
<b>DEEP WATERLINE</b>	Tanks extending from the bottom or inner bottom of a vessel up to or higher than the lowest deck. They are fitted with hatches so that they may be used for cargo when the vessel is loaded in lieu of the ballast water carried when the vessel is 'light'. They are placed at either end or both ends of the machinery space, as deemed necessary.
<b>DEPTH, EXTREME DEPTH, MOLDED</b>	The waterline at which the vessel floats when carrying the maximum allowable load.
<b>DERRICK</b>	The depth of the ship from the upper deck to the underside of the keel.
<b>DEVIL'S CLAW</b>	The vertical distance from the molded base line to the top of the uppermost strength deck beam at side, measured at mid-length of the vessel.
<b>DISHED PLATES</b>	A device consisting of a kingpost, boom with variable topping lift, and necessary rigging for hoisting heavy weights, cargo, etc. A crane consisting of a boom and a mast with a whip and a tackle connected to a deck winch. Derricks may be arranged for fixed outreach work or slewing derricks may be fitted. Most older ships use winches together with derricks for cargo handling.
<b>DISPLACEMENT</b>	A stretching screw with two heavy hooks or claws. It is used to secure an anchor in a hawse pipe.
<b>DISPLACEMENT CURVES</b>	Plates, generally of circular shape, which have been furnace or pressed into a concave form.
<b>DISPLACEMENT, DESIGNED</b>	The volume of fluid displaced by a freely floating and unrestrained vessel, the weight of which exactly equals the weight of the vessel and everything on board at the time the displacement is recorded. Displacement is expressed in either cubic feet or in tons of salt or fresh water.
<b>DISPLACEMENT, FULL LOAD</b>	Curves drawn to give the displacement of the vessel at varying draughts. Usually these curves are drawn to show the displacement in either salt or fresh water, or in both, the salt water curves being based on 35 cubic feet to a ton and fresh water curves on 36 cubic feet to a ton. Corrections are made from these basic standards for variable density of the water.
<b>DISPLACEMENT, LIGHT</b>	The displacement of a vessel when floating at her designed draught.
	The displacement of a vessel when floating at her greatest allowable draught as established by the classification societies. In warships, an arbitrary full load condition is established.
	The displacement of the vessel complete with all items of outfit, equipment, and machinery on board, but excluding all cargo, fuel, water, stores, passengers, dunnage, and the crew and their effects. Naval and merchant practice differs in one particular; in the former, the machinery weights are dry; while the merchant light condition includes the water and oil in the machinery with boilers at steaming level.

<b>DOCK</b>	A basin for the reception of vessels. Wet docks are utilized for the loading and unloading of ships. Dry docks are utilized for the construction or repair of ships.
<b>DOCKYARD</b>	A shipyard or plant where ships are constructed or repaired.
<b>DOG</b>	A short metal rod or bar fashioned to form a clamp or clip and used for holding watertight doors, manholes or pieces of work in place.
<b>DOG SHORES</b>	Diagonal braces placed to prevent the sliding ways from moving when the shores and keel blocks are removed before launching. Dog shores are the last timbers to be knocked away at a launching. Also called 'daggers' or 'dagger shores'.
<b>DOLPHIN</b>	A term applied to several piles that are bound together, situated either at the corner of a pier or out in the stream and used for docking and warping vessels. Also applied to single piles and bollards on piers that are used in docking and warping.
<b>DONKEY ENGINE</b>	A small gas, steam, or electric auxiliary engine set on the deck and used for lifting, etc.
<b>DOOR, AIRTIGHT</b>	A door so constructed that when closed, it will prevent the passage of air under a small pressure. Used on air locks to boiler rooms under forced draft and in similar locations.
<b>DOOR FRAME</b>	The frame surrounding a door opening on which the door seats.
<b>DOOR, JOINER</b>	A light door fitted to staterooms and quarters where air and water tightness is not required. Made of wood, light metal, and metal-covered wood. Metal joiner doors with pressed panels are extensively used.
<b>DOOR, WATERTIGHT</b>	A door so constructed that, when closed, it will prevent water under pressure from passing through. A common type consists of a steel plate, around the edges of which a frame of angle bar is fitted, having a strip of rubber attached to the reverse side of the flange that is fastened to the door plate. The strip of rubber is compressed against the toe of the flange of an angle-iron door frame by dogs or clamps.
<b>DOUBLE BOTTOM</b>	A term applied to the space between the inner and outer skins of a vessel called respectively the 'inner bottom' and 'shell', usually extending from bilge to bilge and for nearly the whole length of the vessel fore and aft, and subdivided into water or oil tight compartments. In some cases, and generally in warships, the inner bottom is carried above the bilges to a deck at or near the waterline. Where more than one inner skin is fitted, as is sometimes the case, the two spaces are known as the 'lower bottom tank' or 'void' and the 'upper bottom tank'. The outer skin is known as the 'shell', the skin next to it as the 'lower inner bottom' and the third skin, as the 'upper inner bottom'.
<b>DOUBLING PLATE</b>	An extra plate secured to the original plating for additional strength or to compensate for an opening in the structure. A small piece of plate attached to a larger area of plate that requires strengthening in that location. Usually at the attachment point of a stiffener. Also, a plate welded to a plated structure that has suffered damage.
<b>DOUBLE-SKIN PANEL</b>	Hatch cover panel in which both top and bottom surfaces are plated-in.
<b>DOWEL</b>	A pin of wood or metal inserted in the edge or face of two boards or pieces to secure them together.



**DRAUGHT**

The depth of the vessel below the waterline measured vertically to the lowest part of the hull, propellers, or other reference point. When measured to the lowest projecting portion of the vessel, it is called the 'draught, extreme'; when measured at the bow, it is called 'draught, forward'; and when measured at the stern, the 'draught, aft'; the average of the draught forward and the draught aft is the 'draught, mean' and the mean draught when in fully loaded condition, is the 'draught load'.

**DRAUGHT MARKS**

The numbers which are placed on each side of a vessel near the bow and stern, and often also amidships, to indicate the distance from the number to the bottom of the keel or a fixed reference point. These numbers are six inches high, are spaced twelve inches bottom to bottom vertically, and are located as close to the bow and stern as possible.

**DRAUGHT SURVEY**

Draught surveys are used to determine the weight of bulk cargo, such as Iron Ore, Coal, Steel scrap and some specific quantities of liquid loaded onto, or discharged from, a vessel.

Draught surveys are a convenient and economical means of ascertaining the quantity of cargo loaded or discharged from a ship by reading the vessel's draughts, measuring the ballast water, fuel and diesel oil and other liquids on board, and calculating the final quantity by using the vessel's approved deadweight scales and tank calibration tables, etc.

In principle, draught surveys require only a measurement of water displaced by the vessel before and after the cargo is transferred, along with a measurement of the water's density. Water displacement is measured through draught marks on the ship and converted to a volume using draught tables (hydrostatic tables). The weight of the displaced water is calculated by multiplying its volume (displacement) by its density. The difference between the weights of water displaced before and after the cargo transfer, will equal the weight of the cargo within measured accuracy limits.

Ideally, while the survey is in progress, the ship should be upright with a trim of not more than 1.0 meter by the stern and lying still in the water, ballast tanks either full (pressed-up) or empty. Any other condition gives rise to a host of corrections, which increase the probability of errors. In practice, draught surveys are complicated procedures that require a highly qualified draught Surveyor.

**DRAG**

The designed excess of draught, aft, over that forward, measured from the designer's waterline. The drag is constant and should not be confused with trim.

**DRIFT**

When erecting the structure of a ship and rivet holes in the pieces to be connected are not concentric, the distance that they are out of line is called the drift. This should be corrected by reaming the holes, but common practice, which is prohibited in naval work, is to drive tapered pins, called 'drift pins', into the unfair holes to force them into line.

**DRIFT PIN**

A conical-shaped pin gradually tapered from a blunt point to a diameter a little larger than the rivet holes in which it is to be used. The point is inserted in rivet holes that are not fair, and the other end is hammered until the holes are forced into line.

**DRY DOCK, FLOATING**

A hollowing floating structure of L- or U-shaped cross section, so designed that it may be submerged to permit floating a vessel into it, and that it may then raise the vessel and itself so that the deck of the dock and consequently, the bottom of the vessel, is above the level of the water. The bottom of a floating dry dock consists of one or more pontoons or rectangular-shaped vessels with high wing structure erected on one or both sides, according to whether the section is to be L- or U-shaped. The deck of the pontoon is fitted with stationary keel blocks and movable bilge blocks which can be pulled under a vessel from the top of the wing structure. Pumps are fitted in the wings by which the dock can be quickly submerged or raised. Floating dry docks are used for repairing and painting the underwater portions of vessels and for docking a damaged vessel.

**DRY DOCK, GRAVING**

A basin excavated at a waterway and connected thereto by gates or a caisson which may be opened to let a vessel in or out and then closed and the water pumped out. The dock is fitted with stationary keel blocks and movable bilge blocks, which usually are fitted on rack tracks, allowing them to be pulled under a vessel before the water is pumped out. Graving docks are common in navy yards, and although more expensive to construct than floating dry docks, they are practically permanent and supply a more rigid foundation for supporting a ship. The gate of a graving dry dock is usually a caisson which is a complete vessel in itself, having a strong rectangular-shaped keel and end posts which bear against the bottom sill and side ledges at the entrance of the dry dock. The caisson is designed so that its draught may be adjusted by water ballast until it bears against the sill and ledges and is equipped with flood valves and power pumps to make this adjustment. When a ship is to be docked, sluice valves in the caisson or in the dock structure are opened until the water in the deck reaches the same level as the water outside. The caisson is then floated to one side, allowing a vessel to enter the dock. The caisson is then floated back to close the entrance, completely separating the basin from the waterway, and after the vessel is lined up over the keel blocks, the water is pumped out of the dry dock.

**DUNNAGE**

Timber boards which are laid under cargo parcels to keep the surface of the cargo off the steel deck plating. Its purpose is to provide air space around the cargo and so prevent 'cargo sweat'. Other forms of dunnage material are timber blocks, kraft paper, hessian / burlap, etc.

## E

<b>ECCENTRIC</b>	A form of crank in which a circular disk set eccentrically upon a shaft forms both the crank web and the crank pin and converts circular to rectilinear motion. This rectilinear travel is usually short relative to the diameter of the shaft so that an ordinary form of crank is impractical.
<b>EDGE</b>	An abrupt border or margin, a bounding or dividing line, the part along the boundary.
<b>EDGE, SIGHT</b>	That edge of a strake of plating which laps outside another strake and is therefore, in plain sight.
<b>ELBOW-ELL</b>	A pipe fitting that makes an angle between adjacent pipes, always 90 degrees unless another angle is stated.
<b>ELECTRODE</b>	Either a positive or negative pole or terminal in an electric circuit. See 'polarity'.
<b>EMBARKATION LADDER</b>	The ladder provided at survival craft embarkation stations to permit access to survival craft after launching.
<b>ENGINE ROOM</b>	Space where the main engines of a ship are located.
<b>ENTRANCE</b>	The forward underwater portion of a vessel at or near the bow. The angle formed between the centerline of the ship and the tangent to the designated waterline is called the angle of entrance.
<b>EQUILIBRIUM, NEUTRAL</b>	The state of equilibrium in which a vessel inclined from its original position of rest by an external force tends to maintain the inclined position assumed after that force has ceased to act.
<b>EQUILIBRIUM, STABLE</b>	The state of equilibrium in which a vessel inclined from its original position of rest by an external force tends to return to its original position after that force has ceased to act.
<b>EQUILIBRIUM, UNSTABLE</b>	The state of equilibrium in which a vessel inclined from its original position of rest by an external force tends to depart farther from the inclined position assumed after that force has ceased to act.
<b>ERECTION</b>	The process of hoisting into place and joining the various parts of a ship's hull, machinery, etc.
<b>EVAPORATOR</b>	An auxiliary for supplying fresh water, consisting of a salt water chamber heated by coils or nests of tubing through which live steam is circulated, converting the water into steam which is passed to a condenser or distiller to make up loss of boiler feed water or for other purposes requiring fresh water.
<b>EVEN KEEL</b>	When a boat rides on an even keel, its plan of flotation is either coincident with or parallel to the designed waterline.
<b>EXPANSION JOINT</b>	A term applied to a joint which permits linear movement to take up the expansion and contraction due to changing temperature or ship movement.
<b>EXPANSION TANKS</b>	Overflow tanks used to provide for expansion, overflow, and replenishment of oil in stowage or cargo tanks.
<b>EYE</b>	A hole through the head of a needle, pin, bolt, etc., or a loop forming a hole or opening through which something is intended to pass, such as a hook, pin, shaft, or rope. A 'worked eye' is one having its edges rounded off like a ring, while a 'shackle eye' is drilled straight through, permitting an inserted bolt or pin to bear along its entire length.

**EYE BOLT**

A bolt having either a head looped to form a worked eye or a solid head with a hole drilled through it forming a shackle eye.

**EYES**

The forward end of the space below the upper deck of a ship which lies next abaft the stem where the sides of the ship approach very near to each other. The hawse pipes are usually run down through the eyes of a ship.

## F

<b>FABRICATE</b>	To shape, assemble, and secure in place the component parts in order to form a complete whole; to manufacture
<b>FACE PLATE</b>	A flat plate fitted perpendicular to the web and welded to the web plate, or welded or riveted to the flange or flanges of a frame, beam stiffener, or girder to balance the continuous plating attached to the opposite flange of the member.
<b>FACTOR OF SAFETY</b>	The ratio between either the ultimate strength of the elastic limit of the material and the allowed working stress. The former is usually referred to as the 'nominal factor of safety' and the latter as the 'real factor of safety'. Elastic materials may have both nominal and real factors of safety, while for those materials having approximately the same values for ultimate strength and elastic limit, the distinction between real and nominal factors of safety is nonexistent.
<b>FAIR or FAIR UP</b>	To so draw the lines of a vessel that the defined surfaces will show no irregularities throughout their entire extent. To line up the frames of a vessel under construction to their proper position. Rivet holes are said to be fair when corresponding holes in the members joined are concentric.
<b>FAIRLEADER or FAIRLEAD</b>	A fitting or device used to preserve or to change the direction of a rope, chain, or wire so that it will be delivered fairly or on a straight lead to a sheave or drum without the introduction of extensive friction. Fairleaders, or fairleads, are fixture as distinguished from temporary block rigs.
<b>FAIRWATER</b>	A term applied to plating fitted to form a shape similar to a frustrum of a cone around the ends of shaft tubes and strut barrels to prevent an abrupt change in the streamlines. Also applied to any casting or plating fitted to the hull of a vessel for the purpose of preserving a smooth flow of water.
<b>FAKE</b>	To lay a rope or chain down in long bights side by side or in coils in regular order so that it will run out clear or can be easily and rapidly paid out. Also one complete circle of a coil of rope.
<b>FALL</b>	By common usage, the entire length of rope used in a tackle, although a strict adherence to the term would limit its application to that end to which the power is applied. The end secured to the block is called the standing part, the opposite end, the hauling part.
<b>FALLS</b>	Wires or ropes used to hoist or lower a boat or cargo.
<b>FANTAIL</b>	The overhanging stern section of vessels which have round or elliptical after endings to uppermost decks and which extend well abaft the after perpendicular.
<b>FASCIA</b>	A strip of wood used on covering openings in joiner work.
<b>FAST</b>	A rope or chain used to moor a vessel to a wharf, designated in accordance with the end of the boat with which it is used as bow-fast or stern-fast. See "Painter".
<b>FATHOM</b>	A nautical unit of length used in measuring cordage, chains, depths, etc. The length varies in different countries, being six feet in the United States and Great Britain.
<b>FELLOES</b>	Pieces of wood which form the rim of a wheel.

<b>FENDER</b>	The term applied to various devices fastened to or hung over the sides of a vessel to prevent rubbing or chafing against other vessels or piers. On small craft, such as tug boats, fenders of timber faced with hardwood or flat steel plate, or of steel structure, run fore and aft on the outside of the vessel above the waterline and are firmly secured to the hull. Wood spars, bundles of rope, woven cane, or rope-covered cork are hung over the sides by lines when permanent fenders are not fitted.
<b>FID</b>	A wood or metal bar used to support the weight of a topmast or a top-gallant mast when in position, being passed through a hole or mortise at its heel and resting on the trestle trees or other support. Also a hardwood tapering pin or tool, used by sailmakers and riggers to open the strands of a rope, eye, grommet, etc.. A 'hand fid' is rounded at the ends, a 'standing or cringle fid' is larger than a hand fit and has a flat base.
<b>FIDLEY</b>	Framework built around a weather-deck hatch through which the smoke pipe passes.
<b>FIDLEY DECK</b>	A partially raised deck over the engine and boiler rooms, usually around the smokestack.
<b>FIDLEY HATCH</b>	Hatch around smokestack and uptake.
<b>FILLET</b>	A term applied to the metal filling in the bosom or concave corners where abrupt changes in direction occur in the surface of a casting, forging, or weldment.
<b>FIN</b>	A projecting keel. A thin plane of metal projecting from hull, etc.
<b>FIRE MAIN</b>	A sea water supply system for fire hydrants. It consists of sea inlets, suction piping, fire pumps and a distributed piping system supplying fire hydrants, hoses and nozzles located throughout the vessel.
<b>FIRE MONITOR</b>	Fixed foam / powder / water cannon shooting fire-extinguishing agents on the vessel's main deck.
<b>FITTINGS, PIPE</b>	A term applied to the connections and outlets, with the exception of valves and couplings, which are attached to pipes.
<b>FIXED LIGHT</b>	A thick glass, usually circular in shape, fitted in a frame fixed in an opening in a ship's side, deck house, or bulkhead to provide access for light. The fixed light is not hinged. Often incorrectly called a dead light.
<b>FLAGSTAFF</b>	Flag pole, usually at the stern of a ship; carries the ensign.
<b>FLANGE</b>	The turned edge of a plate or girder which acts to resist bending. The turned edge of a plate or shape for tying in intersecting structural members. A casting or forging attached to or worked integral with a pipe to form a disk, normal to the axis of an exterior in the pipe, for connecting lengths of pipe.
<b>FLARE</b>	The spreading out from a central vertical plane of the body of a ship with increasing rapidity as the section rises from the waterline to the rail. Also a night distress signal.
<b>FLAT</b>	A minor section of internal deck often without sheer or camber; also known as a platform.
<b>FLOOR</b>	A plate used vertically in the bottom of a ship running athwartship from bilge to bilge, usually on every frame to deepen it. In wood ships, the lowest frame timber or the one crossing the keel is called the floor.
<b>FLUKES</b>	The palms or broad holding portions at the arm extremities of an anchor, which penetrate the ground.

**FOOTINGS**

Bottom boards of walking flats attached to the side of the frames of small boats where deep floors are not fitted.

**FORE**

A term used in indicating portions or that part of a ship at or adjacent to the bow. Also applied in that portion and parts of the ship lying between the midship section and stem; as, fore body, fore hold, and foremast.

**FORE AND AFT  
FORECASTLE**

Lengthwise of a ship.

A short structure at the forward end of a vessel formed by carrying up the ship's shell plating a deck height above the level of her uppermost complete deck and fitting a deck over the length of this structure. The name applied to the crew's quarters on a merchant ship when they are in the fore part of the vessel.

**FORECASTLE DECK  
FOREFOOT**

A deck forming the upper boundary of a forecastle.

The lower end of a vessel's stem which is stepped on the keel. That point in the forward end of the keel about which the boat pivots in an endwise launching.

**FOREHOOK**

See "breast hook".

**FORE PEAK**

The extreme forward end of the vessel below decks. The forward trimming tank. Located forward of the collision bulkhead.

**FORGING**

A mass of metal worked to a special shape by hammering, bending, or pressing while hot.

**FORK BEAM**

A half beam to support a deck where hatchways occur.

**FORWARD**

At or in the direction of the bow. Also the fore part of the ship.

**FORWARD**

A line perpendicular to the base line and intersecting the forward side of the stem at the designed waterline on which the length is measured.

**PERPENDICULAR**

The part of a ship where entrance region meets the parallel middle body.

**FORWARD SHOULDER**

A term applied to the underwater portion of the outside of a vessel's shell when it is more or less covered with sea growth or foreign matter. It has been found that even an oily film over the vessel's bottom shell retard the speed, while sea growth will reduce a vessels' propulsive efficiency to a large extent. Also, obstructed or impeded by an interference, etc.

**FOUL**

Anchor cable is twisted around or it has been fouled.

**FOUL OF ANCHOR**

A mooring line, wire, fishing net., is would around the propeller.

**FOUL OF PROPELLER**

A term used to describe the growth of marine plants and animals on man-made structures in the sea.

**FOULING**

**FOUND**

To fit and bed firmly. Also, equipped.

**FOUNDER**

To sink as a result of entrance of water.

**FRACTURE**

The propagation of a crack through the thickness of a material. It may be further described by nature of the surface at the break, e.g. *brittle fracture*.

**Brittle fracture**

A break in a brittle piece of metal which failed because stress has exceeded cohesion. Brittle materials crack without significant deformations of the crack surfaces that retain a shiny and smooth appearance.

**Ductile fracture**

A crack in a material that behaves in a ductile manner. This is characterized by significant deformations of the fractured surface.

<b>FRAME</b>	A term generally used to designate one of the transverse ribs that make up the skeleton of a ship. The frames act as stiffeners, holding the outside plating in shape and maintaining the transverse form of the ship.
<b>FRAME, BOSS</b>	A frame that is bent to fit around the boss in the way of a stern tube or shaft.
<b>FRAME LINES</b>	Molded lines of a vessel as laid out on the mold loft floor for each frame, showing the form and position of the frames.
<b>FRAME SPACING FRAMING SYSTEM</b>	The fore-and-aft distances between frames, heel to heel. Arrangements of stiffeners used to support hull plating. Two different types of framing are in general use or may be combined. They are longitudinal, transverse and combined framing.
<b>FREEBOARD</b>	Freeboard is the distance measured from the waterline to the upper edge of the deck plating at the side of the freeboard deck amidship. Ships must have a load line mark located at midships on both sides to indicate the maximum allowable draught under specified conditions (geographical and seasonal).
<b>FREEBOARD DECK</b>	Normally, the uppermost complete deck exposed to weather and sea, which has permanent means of closing all openings in the weather part thereof and below which all openings in the sides of the ship are fitted with permanent means of watertight closing.
<b>FREEBOARD MARK FREE-FALL LAUNCHING</b>	Refer to "Load Line" mark. A method of launching a survival craft whereby the craft with its complement of persons and equipment on board is released and allowed to fall into the sea without any restraining apparatus.
<b>FREE-FALL LIFEBOAT</b>	A lifeboat constructed for free-fall launching. The benefits of free-fall lifeboats are clear: <ul style="list-style-type: none"> <li>- During rapid evacuation in emergencies, the boat slides out from a ramp on board the ship / installation and hits the water well away from the ship or installation with a high positive forward motion. Passengers are safe and secure in an enclosed cabin, safely strapped to anatomically- shaped seats. The lifeboat system is robust and can withstand high winds, powerful waves and extreme weather conditions.</li> </ul>
<b>FREEING PORTS</b>	Holes in the lower portion of a bulwark, which allow deck wash to drain off into the sea. Some freeing ports have swinging gates which allow water to drain off but which are automatically closed by sea-water pressure.
<b>FUNNEL FURRINGS</b>	A smoke stack of a vessel. Strips of timber, metal or boards fastened to frames, joists, etc., in order to bring their faces to the required shape or level, for attachment of sheathing, ceiling, floor, etc.
<b>FUTTOCKS</b>	The pieces of timber of which a frame in a wood ship is composed. Starting at the keel they are called the first futtock, second futtock, third futtock, and so on.



## G

<b>GAFF</b>	A spar to which the top of a fore-and-aft sail is attached. It is usually fitted with a jaw at the mast end to clasp the mast.
<b>GAGE, DRAUGHT</b>	An installation comprising a graduated glass tube, connected at the bottom end with the sea and with the top end open to the air, on which the draught of the vessel is shown by the level of water in the tube.
<b>GALLEY</b>	The space on a vessel in which the food is prepared and cooked.
<b>GALVANIZING</b>	The process of coating one metal with another, ordinarily applied to the coating of iron or steel with zinc. The chief purpose of galvanizing is to prevent corrosion.
<b>GANGBOARD, GANGPLANK</b>	A term applied to boards or a movable platform used in transferring passengers or cargo from a vessel to or from a dock.
<b>GANGWAY</b>	The term applied to a place of exit from a vessel. Gangways are fitted in the sides of a vessel in the shape of ports requiring means of closure or may be movable portions of bulwarks or railings on the weather decks.
<b>GANTLINE or GIRTLINE</b>	A rope reeved through a single block aloft and used for hoisting or lowering rigging, drying clothing and hammocks, etc.
<b>GARBAGE MANAGEMENT PLAN</b>	All ships of tonnage 100 gross or above, as well as every ship which is certified to carry 15 persons or more, must have a Garbage Management Plan. This document should identify procedures for the collection, storage, processing and disposal of garbage on board the ship, including procedures for the use of equipment and should identify the person responsible for carrying the plan out. It should be written in the crew's working language. The crew should be trained in garbage management procedures and should be acquainted with the content of the plan. It is the Master's responsibility to ensure that the plan is effectively followed and implemented.
<b>GARBAGE RECORD BOOK</b>	Ships with a Garbage Management Plan are also required to have a Garbage Record Book on board in a place where it can be easily inspected. The record book must be filled in by the Officer in charge after every discharge of garbage into the sea, every delivery of garbage to the port waste reception facility and every incineration operation. Each entry should highlight the position of the ship, the date and the time of the operation, an estimate of the amount and description of the type of garbage. The Master of the ship signs each page after it is completed. The record should be kept for 2-years once the book is completed.
<b>GARBOARD</b>	The strakes of outside plating next to the keel. These strakes act in conjunction with the keel and are usually thicker than the other bottom strakes.
<b>GASKETS</b>	Packing materials, by which air, water, oil, or steam tightness is secured in such places as on doors, hatches, steam cylinders, manhole covers, or in valves, between the flanges of pipes, etc. Such materials as rubber, canvas, asbestos, paper, sheet lead and copper, soft iron, and commercial products, are extensively used.

**GAUGING**

1. Tank gauging, level gauging – the process of measuring tank content.
2. Thickness measurements which are carried out to evaluate the corrosion wastage of hull structure; ultrasonic thickness (UT) measurement is applied in the maritime industry. The gauging of a plate or member normally starts out with two readings. If one appears to indicate a suspect condition, then more readings are taken.

**GEAR**

A comprehensive term in general use on shipboard signifying the total of all implements, apparatus, mechanism, machinery, etc., appertaining to and employed in the performance of any given operation, as “cleaning gear”, “steering gear”, “anchor gear”, etc.

**GEARED**

A vessel equipped to load and discharge by its own means (derricks or cranes).

**GEARLESS**

A vessel not equipped to load and discharge by its own means (without derricks or cranes).

**GEARING**

A term applied to wheels provided with teeth that mesh, engage, or gear with similar teeth on other wheels in such a manner that motion given to one wheel will be imparted to the other.

**GENERATOR**

A machine which converts mechanical power into electrical power. The 3-phase AC/type Generators are used nowadays on board ships. An AC Generator is the same machine as a synchronized motor. It used rotor field windings powered by a direct current which induce an AC output voltage on the stator armature windings.

**GIB**

A metal fitting to hold a member in place or press two members together, to afford a wearing or bearing surface, or to provide a means of taking up wear.

**GIMBALS**

A device by which a ship’s compass, chronometer, etc., is suspended so as to remain in a constant horizontal position irrespective of the rolling or pitching of the vessel. It consists of two concentric brass hoops or rings whose diameters are pivoted at right angles to each other on knife-edge bearings.

**GIRDERS**

On ships this term is used to define a structural member which provides support for more closely spaced members, such as beams, frames, stiffeners, etc., which are at right angles to it and which either rest upon it or are attached to its web. It may be longitudinal or transverse, continuous or intercostal, and is usually supported by bulkheads and stanchions. The term is also used to designate the longitudinal members in the double bottom.

**GIRTH**

The distance measured on any frame line, from the intersection of the upper deck with the side, around the body of the vessel, to the corresponding point on the opposite side.

**GLAND**

A device for preventing leakage at a machine joint, as where a shaft emerges from a vessel containing a pressurized fluid (e.g. *stern tube*).

**GLOBE VALVE**

A valve with a spherically-shaped body enclosing the valve seat or disc. Liquid flow is arranged from the below to the above of the valve seat so that the upper chamber is not pressurized when the valve is closed.

**GOOSENECK**

A swiveling fitting on the keel or mast end of a boom for connecting the boom to the mast. Also called a Pacific iron.

<b>GOUGING</b>	The removal of metal from a welded seam in order to make a back-run for a butt weld. Gouging is frequently employed in preference to grinding for the removal of large quantities of weld metal prior to repairs or modifications to the weld preparation. The gouging process employs a carbon electrode to create an arc against the work piece and a jet of compressed air removes the subsequent pool of molten metal.
<b>GRAB</b>	A bulk cargo-handling device consisting of a bucket which is hinged to open and close. It is open when lowered into the cargo and then closed and lifted out full. It is opened to discharge the cargo ashore, or into a ship's cargo hold.
<b>GRAB, HAND</b>	A metal bar fastened to a bulkhead, house side, or elsewhere, to provide a means of steadying a person when the ship rolls or pitches.
<b>GRAB, HANDLING</b>	Certain types of bulk cargoes may be discharged by means of special grabs. Such grabs are either connected to the ship's derricks or to their cranes and sometimes to shore cranes. The inner bottom should be reinforced in order to withstand grab discharging.
<b>GRAIN</b>	Wheat, maize (corn), oats, rye, barley, rice, pulses, seeds and their processed forms. Grain stows at 1.2 – 2.0 m <sup>3</sup> /t. It has a low angle of repose and shifts easily if not properly stowed. Grain can be easily damaged during shipment. It is particularly important that seawater does not leak through the hatches.
<b>GRAIN CAPACITY</b>	The cubic capacity of a cargo hold measured to the shell plating.
<b>GRAIN HATCH</b>	A small, manually-secured hatch fitted to the hatch cover, used during loading of grain cargoes.
<b>GRAPNEL</b>	An implement having from four to six hooks or prongs, usually four, arranged in a circular manner around one end of a shank having a ring at its other end. Used as an anchor for small boats, for recovering small articles dropped overboard, to hook onto lines, and for similar purposes. Also known as a grappling hook.
<b>GRATING</b>	Light, perforated platform or walkway built-up of metal bars, used for access to machinery.
<b>GRATINGS</b>	A structure of wood or metal bars so arranged as to give a support or footing over an opening, while still providing spaces between the members for the passage of light and the circulation of air.
<b>GRIPLE</b>	The sharp forward end of the dished keel on which the stem is fixed. A curved piece of timber joining the forward end of the keel and the lower end of the cutwater. A lashing, chain, or the like, used to secure small boats in the chocks and in sea position in the davits.
<b>GRIPES</b>	Wire ropes which secure a lifeboat against the cradle when it is up on the davits.
<b>GROMMET</b>	A wreath or ring of rope. Fibre, usually soaked in red lead or some such substance, and used under the heads and nuts of bolts to secure tightness. A worked eye in canvas.
<b>GROUND TACKLE</b>	A general term for all anchors, cables, ropes, etc., used in the operation of mooring and unmooring a ship.
<b>GROUNDWAYS</b>	Timbers fixed to the ground and extending fore and aft under the hull of each side of the keel, to form a broad surface track on which the ship is end-launched. "Groundways" for a side launching embody similar basic features.

**GUDGEONS**

Lugs cast or forged on the stern post for the purpose of hanging and hinging the rudder. Each is bored to form a bearing for a rudder pintle and is usually bushed with lignum vitae or white bearing metal.

**GUNWALE**

A term applied to the line where a weather deck stringer intersects the shell. The upper edge of the side of an open boat.

**GUNWALE BAR**

A term applied to the bar connecting a stringer plate on a weather deck to the sheer strake.

**GUSSET PLATE**

A bracket plate lying in a horizontal, or nearly horizontal, plane. The term is often applied to bracket plates. A triangular plate, usually fitted to distribute forces at a strength connection between two structural members.

**GUTTER EDGE**

A bar laid across a hatchway to support the hatch cover.

**GUYS**

Wire or hemp ropes or chains to support booms, davits, etc., laterally, employed in pairs. Guys to booms that carry sails are also known as back-ropes.

**GYPSY**

A small auxiliary drum usually fitted on one or both ends of a winch or windlass. The usual method of hauling in or slacking off on ropes with the aid of a gypsy is to take one or more turns with the bight of the rope around the drum and to take in or pay out the slack of the free end.

## H

### **HALYARDS**

Light lines used in hoisting signals, flags, etc. Also applied to the ropes used in hoisting gaffs, sails, or yards.

### **HAND RAIL**

A long bar fixed to the side of a passage or stairs for holding onto.

### **HATCH / HATCHWAY**

An opening in a deck through which cargo may be handled, machinery or boilers installed or removed, and access obtained to the decks and holds below. Hatch is properly a cover to a hatchway but is often used as a synonym for hatchway.

### **HATCH BAR**

A term applied to flat bars used for securing and locking hatch covers. A bar over the hatch for rigging a tackle.

### **HATCH BATTENS**

A term applied to flat bars used to fasten and make tight the edges of the tarpaulins that are placed over hatches. The batten and the edge of the tarpaulin are wedged tightly in closely-spaced cleats.

### **HATCH BEAMS**

A term applied to the portable beams fitted in the coamings for the purpose of supporting the hatch covers.

### **HATCH BEARING PADS**

Support pads installed on the hatch coaming in order to transfer the weight of the cover, and any cargo it may be carrying, to the ship hull while allowing for relative movement between the cover and the hatch coaming. Bearing pads must also maintain the correct compression on the hatch cover seal and avoid damage to the coaming/hatch cover interface. Steel/steel bearing pads (Fixpad or Steelpad) are sufficient for most ships. For larger covers, increased relative movements or excessive loadings, a special arrangement based on low friction flexible replaceable sliding pads (Unipad or Lubripad) or non-sliding flexible replaceable pads (Flexipads) is recommended.

#### **Fixpad**

Welded steel pad with the mating surface of wear-resistant steel.

#### **Flexipad**

A non-sliding flexible bearing pad developed by MacGregor. It is made up of flat layers of steel and rubber, bonded together and mounted on a steel plate. The load on Flexipad from the weight of the hatch cover and cargo causes some compression in its rubber elements. A horizontal load causes a sideways deflection of the rubber layers. In general there is no sliding of the pads on the coaming to cause bearing surface wear.

#### **Lubripad**

Lubripad was developed by MacGregor to meet the needs of larger cargo ships and heavier overall loads. A key feature is the patented balance rubber that acts as an equalizer for uneven loads. The replaceable bronze bearing pad is coated with low friction PTFE for even smoother sliding.

#### **Steelpad**

MacGregor's steel pads in a steel holder, mating surface of wear-resistant steel.

#### **Unipad**

MacGregor's replaceable low-friction bearing pad. Unipad has a layer of woven PTFE that creates a low-friction surface between the pad and

**HATCH, BOOBY**

its mating plate. This makes the movement of a heavily-loaded hatch cover possible and minimizes pad/mating plate wear-down.

**HATCH CARRIER**

An access hatchway leading from the weather deck to the quarters. A small companion which is readily removable in one piece. A wooden, hoodlike covering for a hatchway, fitted with a sliding top.

**HATCH CLEATS**

The supports which are attached to the inside of the coaming to take the ends of the hatch beams.

**HATCH COAMING**

A term applied to the clips attached to the outside of the hatch coaming for the purpose of holding the hatch battens and wedges which fasten the edges of the tarpaulin covers.

**HATCH COVER**

Vertical plating bounding a hatch in order to stiffen its edges and resist entry of water into the space below.

A large steel structure fitted over a hatch opening to prevent the ingress of water into the cargo hold. It may also be the supporting structure for deck cargo. Various designs exist for particular applications. The hatch cover has to be weatherproof and has to remain so when conditions change as a result of waves, temperature and cargo.

**Folding hatch covers**

Folding hatch covers for weather decks can be either of the low or high stowing type. The low stowing version and single pull hatch covers are designed in a number of panel configurations. The high stowing versions are also available in a number of configurations: for example, with two to six panels and with stowing taking place at one or both ends of a hatch.

**Lift-and-roll Piggy-Back covers**

One panel of each pair is operated by high-lifting hydraulic cylinders for vertical movement. The horizontal movement of the other panel is achieved by traction drive via electric motor, planetary gear and hydraulic brake after it has been raised by a wheel-lifting device.

**Lift-away hatch covers**

Usually multi-panel units designed so that there are several panels for each hatch opening. They can be opened in an independent order and they allow partial hatch opening. Hatches are opened with a spreader using the vessel cranes or container cranes on shore. After removal, the panels can be stowed on top of adjacent covers which are placed on the quay or on the ship deck. The weight of the cover, and any cargo stowed on it, is transferred to the ship structure by bearing pads.

**Pontoon hatch covers**

Pontoon type hatch covers feature a flat top and flat bottom plate and are weathertight.

**Rolling hatch covers**

Rolling covers are divided into two main types considering opening direction. Side-rolling covers open sideways and end-rolling covers lengthwise. Both types are well suited to act as weather deck covers for

<b>HATCH COVER PANEL SEALS</b>	<p>dry bulk carrier and, when designed to sustain internal liquid loads, also for OBO and Ore/Oil ships.</p> <p><b>Double rubber lip seal</b> In case of reduced water-tightness on cellular container vessels, some Classification Societies allow the use of a joint between panels fitted with a double rubber lip seal preventing rain and spray from entering the hold.</p> <p><b>Swing-seals</b> Hydraulically or manually operated seals for watertight non-sequential operation. The swing-seal comprises of a foldable steel beam fitted with gaskets. In the sea-going condition, the beam seals the joint and when the hatch is open in the port, the panels can be handled in any order. Folding of the sealing beam can be performed by hydraulic cylinders, or manually by a ratchet or pneumatic power tool.</p>
<b>HATCH RAILS</b>	<p><b>Hatch cover seals</b> The sealing between hatch cover and coaming is generally achieved by sliding rubber packing, which is fitted to the panels and tightens against the top of the coaming when the hatches are lowered into the closed position.</p> <p>Ropes supported by stanchions around an open hatch to prevent persons from falling into a hold.</p>
<b>HATCH RESTS</b>	<p>A term applied to the shelf fitted inside and just below the top of the coaming for the purpose of supporting the hatch covers.</p>
<b>HATCH, HATCHWAY</b>	<p>A rectangular opening in a deck through which cargo and stores are loaded or unloaded.</p>
<b>HATCH SEALING TAPE HATCHWAY TRUNK</b>	<p>Any type of adhesive tape used to seal cross-joints externally.</p> <p>A term applied to the space between a lower deck hatchway and the hatchway or hatchways immediately above it when enclosed by a casing.</p>
<b>HAWSE</b>	<p>A trunk may be either watertight or non-watertight.</p> <p>The hawse hole; also the part of a ship's bow in which the hawse holes for the anchor chains are located.</p>
<b>HAWSE BAG</b>	<p>A conical-shaped canvas bag, stuffed with sawdust, oakum, or similar material, and fitted with a lanyard at apex and base, used for closing the hawse pipes around the chain to prevent shipping water through the pipes; also called a "jackass", "hawse plug", or "hawse block".</p>
<b>HAWSE HOLE HAWSE PIPES</b>	<p>A hole in the bow through which a cable or chain passes.</p> <p>Tubes leading the anchor chain from the deck on which the windlass is located down and forward through the vessel's bow plating.</p>
<b>HAWSER HEAD OF A SHIP</b>	<p>A large rope or a cable used in warping, towing, and mooring.</p> <p>The fore end of a ship which was formally fitted up for the accommodation of the crew. A term applied to a toilet on board a ship.</p> <p>A ship is trimmed by the head when drawing more water forward and less aft than contemplated in her design.</p>

**HEAVE**

To haul; to case or hurl; as to heave the lead, to have a line. The alternate rising and falling of a vessel in a seaway.

**HEAVING LINE**

A small line thrown to an approaching vessel, or a dock as a messenger.

**HEAVY LIFT DERRICK**

A cargo-handling device for heavy large items.

**HEAVY LIFT SHIPS**

Specialized ships capable of transporting non-standardized heavy cargoes. They can be subdivided into four main categories, i.e. project cargo ships, open deck cargo ships, dock ships and semi-submersible ships.

As most heavy lift cargoes are unique, the Management of those require very careful planning and coordination to the smallest detail. Detailed information on cargo and the location of loading and discharge, are studied in the preparation phase, often even before the contract is actually booked.

Many projects demand detailed operation manuals, which must be approved by a client and a Warranty Surveyor. Stowage and lifting plans are all prepared with 2D and 3D CAD systems, whereas complicated lifting situations can be simulated step-by-step.

#### **Project Cargo Ships**

Relatively small ships, often with a large box-shaped hold, used for carrying small machinery, port equipment, locomotives, knocked-down cranes, small boats/yachts, etc.

#### **Open Deck Cargo Ships**

Ro-Ro type vessels with a superstructure positioned forward. They are designed for the transport of large modules, fully-erected container cranes, etc., on a large open cargo deck, accessible with a full width stern ramp.

#### **Dock Ships**

Are characterized by the full-length side walls protecting the cargo area. The cargo can be loaded by a float-in / float-out by submerging the ship until the dock deck is underwater, lift-on / lift-off, using cranes, roll-on / roll-off, over the ship's stern ramp.

#### **Semi-submersible Ships**

Vessels that are horizontally submerged until their main deck is underwater to a depth of 6-14 meters and large cargoes can then be loaded using the float-on / float-off method. In this case, the load must be barge-mounted or able to float itself. The ship itself sinks similarly to a floating-dock and the cargo is floated onboard. Typical cargoes are drilling rigs, floating plants, dredging equipment, off-shore structures, floating dry docks and/or other vessels.



<b>HEEL</b>	The convex intersecting point or corner of the web and flange of a bar. The inclination of a ship to one side, caused by wind or wave action or by shifting weights on board.
<b>HEEL PIECE, HEEL BAR</b>	A bar that serves as a connecting piece between two bars which but end-to-end. The flange of the heel bar is reversed from those of the bars it connects.
<b>HELM</b>	The term applied to the tiller, wheel, or steering gear, and also the rudder.
<b>HOG</b>	A scrub broom for scraping a ship's bottom underwater.
<b>HOG FRAME</b>	A fore-and-aft frame, forming a truss for the main frames of a vessel to prevent bending.
<b>HOGGING</b>	A term applied to the distortion of a vessel's hull when her ends drop below their normal position relative to her midship portion.
<b>HOG SHEER</b>	The sheer curve of the deck on a vessel, constructed so that the middle is higher than the ends.
<b>HOIST</b>	To raise or elevate by manpower or by the employment of mechanical appliances; any device employed for lifting weights.
<b>HOLD</b>	The space or compartment between the lowermost deck and the bottom of the ship, or top of the inner bottom if one is fitted. The space below decks allotted for the stowage of cargo.
<b>HOLD BEAMS</b>	Beams in a hold similar to deck beams but having no decking or planking on them.
<b>HOME</b>	Close up, snugly in place; as, to drive home a bolt.
<b>HOOD</b>	A shelter over a companionway, scuttle, etc. It is generally built of canvas spread over an iron frame. It may also be constructed of light metal plating.
<b>HOODS</b>	A term applied to those plates placed at the extreme forward or after ends of a ship.
<b>HOODING END</b>	The endmost plate of a complete strake. The hooding-ends fit into the stem or stern post.
<b>HOPPER SIDE TANKS</b>	Tanks used for ballast or for stability when carrying certain cargoes in bulk carriers. Also referred to as topside wing ballast tanks or bottom hopper tanks.
<b>HORNING</b>	Setting the frames of a vessel square to the keel after the proper inclination to the vertical due to the declivity of the keel has been given.
<b>HOUSING</b>	A term applied to an enclosure partially or wholly worked around fittings or equipment. That portion of the mast below the surface of the weather deck. Applied to topmasts, that portion overlapping the mast below.
<b>HULL</b>	The framework of a vessel, together with all decks, deck houses, and the inside and outside plating or planking, but exclusive of masts, yards, rigging, and all outfit or equipment.
<b>HULL APPENDAGES</b>	Any protruding part of the hull structure that is below the waterline (rudder, bilge keels, thrusters, propeller, etc.).
<b>HYDRANT</b>	The terminal point of a water main with fittings for the attachment of a hose pipe.
<b>HYDRO-BLASTING</b>	The method used for cleaning of the surface to be repaired. The degree of cleaning depends on the pressure of the water jet. For achieving a complete cleaning, the removal of rust and all paint layers, a pressure greater than 1700 bar is recommended (Ultra High Pressure Hydro-blasting).
<b>HYDROSTATIC CURVES</b>	A series of graphs drawn to a vertical scale of draught and a base of length, which gives values such as <i>centre of buoyancy</i> , <i>displacement</i> , <i>moment causing unit trim</i> and <i>centre of floatation</i> . In practice, tables with hydrostatic parameters calculated for different draughts are used.

**HYDROSTATIC RELEASE UNIT (HRU)** A part of the life raft lashing used for automatic life raft release.

I

<b>ICE CLASS</b>	A Classification Society notation given to vessels which have additional strengthening to enable them to operate in ice-bound regions.
<b>IMMERSION</b>	The change in draught resulting from the additional or removal of the particular mass. In the IS system, it is called tonnes per centimeter immersion (TPC).
<b>IMPELLOR</b>	A rotating member of a turbine, blower, fan, pump or water propulsion.
<b>IMPRESSED CATHODIC PROTECTION (ICCP)</b>	<b>CURRENT PROTECTION</b> A controlled cathodic protection of the hull against corrosion. The system incorporates a rectifier, which supplies an automatically regulated direct current to the permanent anodes. The use of ICCP is increasing and the applications now available include: hull protection, thruster tunnel protection and water jet protection.
<b>INBOARD INBOARD PROFILE</b>	Toward the center, within the vessel's shell and below the weather decks. A plan representing a longitudinal section through the center of the ship, showing deck heights, transverse bulkheads, assignment of space, machinery, etc., located on the center plane or between the center and the shell of the far side.
<b>INCLINING TEST</b>	The experiment performed to determine the ship's vertical center of gravity. It consists of shifting a series of known weights transversely across the deck when the ship is free to heel. The resulting change in the equilibrium angle of heel is measured by the shift of a plumb-bob along a batten or by a U-tube. By application of this information and basic naval architecture principles, the ship's vertical center of gravity (VCG or KG) is determined.
<b>INDENT</b>	Deformation of structural members caused by out off-panel loads like bottom slamming or bow impact forces, contact with other objects, etc.
<b>INITIAL STABILITY</b>	The stability of a vessel in the upright position or at small angles of inclination. It is usually represented by the metacentric height.
<b>INNER BOTTOM</b>	A term applied to the inner skin or tank top plating. The plating over the double bottom.
<b>INSERT PLATE</b>	A steel plate of greater thickness which is fitted at a region of increased stress, e.g. <i>hatch corner</i> .
<b>INSULATION OF CARGO SPACES</b>	The cargo holds on board trawlers, reefers and deep-freeze vessels are usually insulated with polyurethane foam and finished with a special waterproof glued plywood. Instead of polyurethane foam, mineral wool can be applied or the combination of both. The insulated floor, in most cases, is finished with glass fibre reinforced polyester.
<b>INTERCOSTAL</b>	Occurring between ribs, frames, etc. The term is broadly applied, where two members of a ship intersect, to the one that is cut.
<b>INTRINSICALLY SAFE</b>	An electrical circuit or part of a circuit is intrinsically safe if any spark or thermal effect produced normally (i.e. by breaking or closing the circuit) or accidentally (e.g. by short-circuit or earth fault), is incapable, under prescribed test conditions, of igniting a prescribed gas mixture.
<b>INVERTER</b>	A static device (circuit) which converts electrical power into the form of direct current (DC) to electrical power in the form of alternating current (AC). Inverters are used to supply electric power to, and to control the speed of, both asynchronous inducting motors and synchronous AC motors.

**IN-WATER SURVEY (IWS)**

The survey of hull plating undertaken in water. The ship is provided with marks placed on the shell to show borders of tanks, cofferdams, etc. Hull plating should be cleaned by a diver-operated machine. A remotely-operated underwater TV camera is used to view the ship's plating.

IWS can also be applied for checking that the seal assembly on all lubricated stern tube bearings is intact and for verifying the clearance or wear-down of the stern bearing. For that, an opening in the top of the seal housing and a suitable gauge, should be provided for checking the clearance by divers.

J

**JACK**

A device which can lift weights or exert a large thrust in order to move or position some equipment. It is usually hydraulically operated.

**JACK LADDER**

A ladder with wooden steps and side ropes.

**JACKSTAFF**

Flagpole at the bow of a ship.

**JACOB'S LADDER**

A ladder having either fiber or wire rope or chain sides with wood or metal rungs attached at regular intervals. One end is usually fitted with sister hooks or shackles for hooking on.

**JOINT, BUTT**

A term applied where a connection between two pieces of material is made by bringing their ends or edges together (no overlap) and by welding alone, or by welding, riveting, or bolting each to a strip of strap that overlaps both pieces.

**JOINT, LAPPED**

A term applied where a connection between two pieces of material is made by overlapping the end or edge of one over the end or edge of the other and by fastening the same by bolts, rivets, or welding.

**JOURNAL**

That portion of a shaft or other revolving member which transmits weight directly to and is in immediate contact with the bearing in which it turns.

**JURY**

A term applied to temporary structures, such as masts, rudders, etc., used in an emergency.

## K

<b>KEEL</b>		A center-line strength member running fore and aft along the bottom of a ship and often referred to as the backbone. It is composed either of long bars or timbers scarfed at their ends or by flat plates connected together by riveting or welding.
<b>KEEL, BILGE</b>		A fin fitted on the bottom of a ship at the turn of the bilge to reduce rolling. It commonly consists of a plate running fore and aft and attached to the shell plating by angle bars. It materially helps in steadying a ship and does not add much to the resistance to propulsion when properly located.
<b>KEEL, BLOCKS</b>		Heavy timber blocks piled one above the other on which the keel of a vessel is supported when being built, or when she is in a dry dock. They are placed under the keel from bow to stern and a sufficient distance apart to allow working between them.
<b>KEEL, DOCKING</b>		In dry docking, the weight of a ship is carried almost entirely on the keel and bilge blocks. The keel and keelson provide the means of distributing the pressure on the center line, and docking keels composed of doubling strips of plate or a heavier plate or built-up girders are sometimes fitted on the bottom at a distance from the center line corresponding to the best position for the bilge block. The docking keels are fitted in the fore and aft direction, generally parallel or nearly so to the keel.
<b>KEELSON, CENTER</b>	<b>VERTICAL</b>	The lower middle-line girder which, in conjunction with a flat plate keel on the bottom and rider plate on top, forms the principal fore-and-aft strength member in the bottom of a ship. In addition to its importance as a "backbone" or longitudinal strength member, it serves to distribute and equalize the pressure on the transverse frames and bottom of the ship when grounding or docking occurs. In steel ships, this keelson usually consists of a vertical plate with two angles running along the top and two along the bottom. The girder, however, may be made up of various combinations of plates and shapes. This member should continue as far forward and aft as possible. Usually called the vertical keel.
<b>KING POST</b>		A strong vertical post used to support a derrick boom. See Samson Post.
<b>KNEE</b>		A block of wood having a natural angular shape or one cut to a bracket shape and used to fasten and strengthen the corners of deck openings and the intersections of timbers, and to connect deck beams to the frames of wood vessels. The term is also applied to the ends of steel deck beams that are split, having one leg turned down and a piece of plate fitted between the split portion, thus forming a bracket or knee.
<b>KNOT</b>		A unit of speed, equaling one nautical mile (6,080.20 feet) an hour, as when a ship goes ten nautical miles per hour, her speed is ten knots.
<b>KNUCKLE</b>		An abrupt change in direction of the plating, frames, keel, deck, or other structures of a vessel.
<b>KORT NOZZLE</b>		A fixed, angular forward extending duct around the propeller. The propeller operates with a small gap between blade tips and the nozzle internal wall, roughly at the narrowest point. The nozzle ring has a cross-section shaped as a hydrofoil.

## L

### LADDER

A framework consisting of two parallel sides, connected by bars or steps which are spaced at intervals suitable for ascending or descending. On shipboard, the term ladder is also applied to staircases and to other contrivances used in ascending or descending to or from a higher or lower level.

### LADDER, ACCOMMODATION

A staircase suspended over the side of a vessel from a gangway to a point near the water to provide easy access to the deck from a small boat alongside.

### LADDER, COMPANION LADDER, SEA

A staircase fitted as a means of access from a deck to the quarters. Rungs secured to the side of a vessel to form a ladder from the weather deck to the water.

### LAGGING

A term applied to the insulating material that is fitted on the outside of boilers, piping, etc.

### LANDING, LANDING EDGE

That portion of the edge or end of a plate over which another plate laps. The covered-up edge.

### LANYARD

The present use of this term is generally limited to a piece of rope or line having one end free and the other attached to any object for the purpose of either near or remote control.

### LAP

A term applied to the distance that one piece of material is laid over another; the amount of overlap, as in a lapped joint.

### LAPSTRAKE

A term applied to boats built on the clinker system in which the strakes overlap each other. The top strake always laps on the outside of the strake beneath.

### LASHING

Wires, chains, ropes or strops used to secure cargo on a ship.

### LAUNCH

A term applied to a small power or motor boat. See Launching.

### LAUNCHING

A term applied to the operation of transferring a vessel from the building ways into the water. End launching and side launching methods are employed; the former method is used when the vessel is built at an angle, usually at right angles, to the waterfront and the vessel is launched stern first, while in side launching, the vessel is built parallel to the waterfront and launched sidewise. In preparing for an end launching, usually ground ways, made of heavy timbers, are laid with an inclination of about 1/2" and 5/8" to the foot parallel to the center line of the ship, one on either side of the keel and spaced about one-third of the beam of the vessel apart. These ground ways run the length of the vessel and for some distance out under the water. On top of the ground ways, are placed the sliding ways, also heavy timbers, and between these two ways, is placed a coating of launching grease.

The sliding ways are prevented from sliding on the greased ground ways by a trigger or similar device and dog or dagger shores. Cradles are built up to fit the form of the vessel, and between the sliding ways and the cradle, wedges are driven and the weight of the ship thus transferred from the building blocks to the sliding ways.

After the building blocks and shores are removed, the trigger is released and gravity causes the vessel to slide down the inclined ways. In some cases, hydraulic jacks are set at the upper end of the ground ways to exert

	pressure on the sliding ways to assist in overcoming initial friction along the ways. A similar procedure is followed in the case of side launchings, except that more than two ground ways are usually used, depending on the length of the ship, and the inclination of the ways is steeper.
<b>LAYING OFF</b>	A term applied to the work done by a lofts-man in laying off the ship's lines to full size in the mold loft and making templates therefrom. Also known as laying down.
<b>LAYING OUT</b>	Placing the necessary instructions on plates and shapes for shearing, planing, punching, bending, flanging, beveling, rolling, etc., from templates made in the mold loft or taken from the ship.
<b>LEADING EDGE</b>	That edge of a propeller blade which cuts the water when the screw is revolving in the ahead direction. That edge of a rudder, diving plane, or strut arm which faces toward the bow of the ship.
<b>LENGTH BETWEEN PERPENDICULARS</b>	The length of a ship measured from the forward side of the stem to the aft side of the stern post at the height of the designated water line. In naval practice, the total length on the designed water line.
<b>LENGTH OVERALL</b>	The length of a ship measured from the foremost point of the stem to the aftermost part of the stern.
<b>LIFT A TEMPLATE</b>	To construct a template to the same size and shape as the part of the ship involved, from either the mold loft lines or from the ship itself, from which laying out of material for fabrication may be performed.
<b>LIFTING</b>	Transferring marks and measurements from a drawing, model, etc., to a plate or other object, by templates or other means.
<b>LIGHT, PORT</b>	An opening in a ship's side, provided with a glazed lid or cover.
<b>LIGHTENING HOLE</b>	A hole cut in any member to reduce weight; a hole cut out of any structural member, as in the web, where very little loss of strength will occur. These holes reduce the weight and in many cases, serve as access holes. This condition is particularly true in floor plates and longitudinals in double bottoms.
<b>LIGHTER</b>	A full-bodied, heavily-built craft, usually not self-propelled, used in bringing merchandise or cargo alongside or in transferring same from a vessel.
<b>LIMBER CHAINS</b>	Chains passing through the limber holes of a vessel, by which they may be cleaned of dirt.
<b>LIMBER HOLE</b>	A hole or slot in a frame or plate for the purpose of preventing water from collecting. Most frequently found in floor plates just above the frames and near the center line of the ship.
<b>LINE</b>	A general term for a rope of any size used for various purposes; small cords such as long line, lead line, or small stuff as marlin, ratline, houseline, etc.
<b>LINER</b>	A piece of metal used for the purpose of filling up a space between a bar and a plate between two plates; a filler.
<b>LINES</b>	The plans of a ship that show its form. From the lines drawn full size on the mold loft floor are made templates for the various parts of the hull.
<b>LIST</b>	The deviation of a vessel from the upright position due to bilging, shifting of cargo, or other cause.



**LOAD LINE**

The line on the “lines plan” of a ship representing the intersection of the ship’s form with the plane of the water’s surface when the vessel is floating with her designed load on board. Also applied to the actual intersection of the surface of the water with a vessel’s side.

**LOAD LINE MARK**

Ship’s must have a load line mark located amidships on both sides to indicate the maximum allowable draught under specified conditions (geographical and seasonal).

The International Convention on Load Lines 1966 (ICLL 1966) with its Protocol of 1988, is a comprehensive set of regulations to determine the minimum allowable *freeboard* and defines the conditions of load line assignment. The minimum geometric summer freeboard is computed by taking a freeboard for a standard ship of the same length (provided in tabular form) and correcting it for those geometric properties of the ship which differ from those of the standard one. There are corrections for block coefficient, depth, superstructure, trunk and sheer. The result of this calculation, the load line mark, is permanent marked on the ship’s hull.

**LOCK-NUT**

A thin nut which is turned down over the regular nut on a bolt to lock the regular nut against turning off. Also applied to a thin nut placed on a pipe to hold packing at a joint or used on both sides of a bulkhead through which a pipe passes, to secure tightness.

**LOCKER**

A storage compartment on a ship.

**LOFTSMAN**

A man who lays off the ship’s lines to full size in the mold loft and makes templates therefrom.

**LONGITUDINALS**

A term applied to the fore-and-aft girders in the bottom of a ship. These girders are usually made up from plates and shapes and are sometimes intercostal and sometimes continuous.

**LOUVER**

A small opening to permit the passage of air for the purpose of ventilation, which may be partially or completely closed by the operation of overlapping shutters.

**LUFF**

To raise or lower a derrick or a crane jib.

## M

<b>MAIN BODY</b>	The hull proper, without the deck houses, etc.
<b>MAIN DECK</b>	The principal deck of the hull, usually the highest extending from stem to stern and providing strength to the main hull.
<b>MANDEL SHACKLE</b>	A special shackle used to connect a wire mooring line to a synthetic tail.
<b>MANGER</b>	A term applied to the manger-like space immediately forward of the manger plate, which is fitted just abaft the hawse pipes to prevent water entering through the pipes from running aft over the deck.
<b>MANHOLE</b>	A round or oval hole cut in decks, tanks, boilers, etc., for the purpose of providing access.
<b>MANIFOLD</b>	A casting or chest containing several valves. Suction or discharge pipes from or to the various compartment tanks, and pumps are led to it, making it possible for a pump to draw from or deliver to any one of several compartments.
<b>MARGIN PLANK</b>	A plank forming the boundary or margin of the deck planking.
<b>MARGIN PLATE</b>	The outer boundary of the inner bottom, connecting it to the shell plating at the bilge.
<b>MARLING SPIKE</b>	A pointed iron or steel tool used to separate the strands in splicing rope, and as a lever in marling or putting on seizings. The wire rope spike has a flat, rounded end and the manila rope spike has a sharp point.
<b>MARLIN</b>	A double-threaded, left-handed tarred cord, about 1/8" diameter, made of a good grade of American hemp.
<b>MAST</b>	A long pole of steel or wood, usually circular in section, one or more of which are usually located, in an upright position, on the center line of a ship. Originally intended for carrying sails, they are now used more as supports for the rigging, cargo and boat-handling gear and wireless equipment.
	OR
<b>MAST COLLAR</b>	A tubular steel erection, which carries various items of navigational equipment and fittings, e.g. lights, radar, etc.
<b>MAST HOUNDS</b>	A piece of wood or a steel shape formed into a ring and fitted around the mast hole in a deck.
<b>MAST HOUNDS</b>	The upper portion of the mast at which the outrigger or trestle trees are fitted. Also applied to that portion at which the hound band for attaching the shrouds is fitted on masts without outrigger or trestle trees.
<b>MAST PARTNERS</b>	A term applied to wood planking or steel plating worked around a mast hole or give side support to the mast.
<b>MAST STEP</b>	A term plied to the foundation on which a mast is erected.
<b>MESSROOM</b>	A space or compartment where members of the crew eat their meals; a dining room. A dining room in which officers eat their meals is called a wardroom mess room.
<b>MIDDLE BODY</b>	That portion of the ship adjacent to the midship section. When it has a uniform cross-section throughout, its length and its waterlines being parallel to the centerline, it is called the parallel middle body.
<b>MIDSHIP BEAM</b>	A deck beam of the transverse frame located at the midpoint between the forward and after perpendiculars. Also applicable to the transverse dimension of the hull at the same point.
<b>MIDSHIP FRAME</b>	The frame located at the midpoint between the perpendiculars.

**MIDSHIP SECTION**

The vertical transverse section located at the midpoint between the forward and after perpendiculars. Usually this is the largest section of the ship in area. Also, applied to a drawing showing the contour of the midship frame upon which is depicted all the structural members at that point with information as to their size and longitudinal extent.

**MIDSHIPS  
MITRED  
MOCK UP**

Same as Amidships.

Cut to an angle of 45 degrees or two pieces joined to make a right angle. To build up of wood or light material to scale or full size a portion of the ship before actual fabrication of the steel work. Used to study arrangement, methods of fabrication, workability, etc.

**MOLD**

A pattern or template. Also a shape of metal or wood over or in which an object may be hammered or pressed to fit.

**MOULDED BREADTH  
EXTREME  
MOULDED DEPTH**

The maximum horizontal breadth of any frame section. The term breadth and beam are synonymous.

The perpendicular distance in a transverse plane from the top of the flat keel to the underside of the deck plating at the ship's side.

**MOULDED EDGE**

The edge of a ship's frame which comes in contact with the skin, and is represented in the drawings.

**MOULDED LINE**

A datum line from which is determined the exact location of the various parts of a ship. It may be horizontal and straight as the moulded base line, or curved as a moulded deck line or a moulded frame line. These lines are determined in the design of a vessel and adhered to throughout the construction. Moulded lines are those laid down in the mould loft.

**MOORING**

A term applied to the operation of anchoring a vessel in a harbor, securing her to a mooring buoy, or to a wharf or dock by means of chains or ropes.

**MOORING LINES**

Lines (or cables) used to secure a ship at a berth. Mooring lines should be arranged as symmetrical as possible about the midship point of the ship.

**Breast lines**

Mooring lines leading ashore as perpendicular as possible to the ship's fore and aft line. Breast lines restrain the ship in one direction (off the berth).

**Head lines**

Mooring lines leading ashore from the fore end or forecastle of the ship, often at an angle of about 45 degrees to the fore and aft line.

**Spring lines**

Mooring lines leading in a nearly fore and aft direction, the purpose of which is to prevent longitudinal movement (surge) of the ship while berthed. Spring lines restrain the ship in two directions: head springs prevent forward motion and back springs prevent aft motion.

**Stern lines**

Mooring lines leading ashore from the aft end or poop of the ship, often at an angle of about 45 degrees to the fore and aft line.

**MOORING WINCH**

A winch with a drum which is used for hauling-in or letting the mooring wires go. A warp end is also fitted to assist in moving the ship.

**MOORING PIPE**

An opening through which mooring lines pass.

**MOTORSHIP**

A ship driven by some form of internal combustion engine. Not generally applied to small boats driven by gasoline engines which are usually called motorboats.

**MUSHROOM VENTILATOR**

A ventilator whose top is shaped like a mushroom and fitted with baffle plates so as to permit the passage of air and prevent the entrance of rain or spray. Located on or above the weather deck to furnish ventilation to compartments below deck.

**N**

**NIBBING PLANK**

A margin plank that is notched to take the ends of regular deck planks and insure good calking of the joint.

**NIPPLE**

A piece of pipe having an outside thread at both ends for use in making pipe connections. Various names are applied to different lengths, as close, short, long, etc.

**NORMALIZE**

To heat steel to a temperature slightly above the critical point and then allow it to cool slowly in air.

**NORMAN PIN**

A metal pin fitted in a towing post or bitt for belaying the line.

**NOSING**

The part of a stair tread which projects beyond the face of the riser.

**O**

**OAKUM**

A substance made from soft vegetable fiber such as hemp and jute impregnated with pine tar. It is principally used for calking the planking on wood decks of steel vessels and for calking all the planking on wood ships where water tightness is desired. It is also for calking around pipes. Having the property of resisting the passage of oil.

**OILTIGHT**

**OLD MAN**

A heavy bar of iron or steel bent in the form of a Z used to hold a portable drill. One leg is bolted or clamped to the work to be drilled and the drill head is placed under the other leg which holds down the drill to its work.

**ON BOARD**

**ON DECK**

**ORLOP DECK**

On or in a ship; aboard.

On the weather deck, in the open air.

The term formerly applied to the lowest deck in a ship; now practically obsolete.

**OUTBOARD**

**OUTBOARD PROFILE**

Away from the center towards the outside; outside the hull.

A plan showing the longitudinal exterior of the starboard side of a vessel, together with all deck erections, stacks, masts, yards, rigging, rails, etc.

**OVERBOARD**

**OVERHANG**

Outside, over the side of a ship into the water.

That portion of a vessel's bow or stern which projects beyond a perpendicular at the waterline.

**OVERHAUL**

To repair or put in proper condition for operation; to overtake or close-up the distance between one ship and another ship moving in the same direction.

**P**

<b>PACKING</b>	A general term applied to a yielding material employed to effect a tight joint, also called gasket material.
<b>PAD-EYE</b>	A fitting having one or more eyes integral with a plate or base to provide ample means of securing and to distribute the strain over a wide area. The eyes may be either “worked” or “shackle”. Also known as lug pads, hoisting pads, etc.
<b>PAINTER</b>	A length of rope secured at the bow of a small boat for use in towing or for making it fast. Also called a bow-fast.
<b>PALM</b>	The fluke, or more exactly, the flat inner surface of the fluke of an anchor; a sailmaker’s protector for the hand, used when sewing canvas; a flat surface at the end of a strut or stanchion for attachment to plating, beams, or other structural members.
<b>PANEL</b>	One unit of a set of hatch cover closures.
<b>PANTING</b>	The pulsation in and out of the bow and stern plating when a ship alternately rises and plunges deep into the water.
<b>PANTING BEAMS</b>	The transverse beams that tie the panting frames together.
<b>PANTING FRAMES</b>	The frames in the fore peak, usually extra heavy to withstand the panting action of the shell plating.
<b>PARALLEL MID-BODY</b>	The ship length for which the midship section is constant in area and shape.
<b>PARCELING</b>	Narrow strips of canvas which are tarred and wound around ropes, following the lay and overlapping in order to shed water. The parceling is applied after worming, preparatory to serving.
<b>PARTNERS</b>	Similar pieces of steel plate, angles or wood timbers used to strengthen and support the mast where it passes through a deck, or placed between deck beams under machinery bed plates for added support.
<b>PAULIN</b>	A term applied to a pliable canvas hatch cover, and also to pieces of canvas used as a shelter for workmen or as a cover for deck equipment.
<b>PAWL</b>	A term applied to a short piece of metal so hinged as to engage in teeth or depressions of a revolving mechanism for the purpose of preventing recoil. Fitted to capstans, windlasses, etc. Also called a Pall.
<b>PAYING</b>	The operation of filling the seams of a wood deck, after the calking has been inserted, with pitch, marine glue, etc. Also applied to the operation of slackening away on a rope or chain.
<b>PEAK, FORE AND AFTER</b>	The space at the extreme bow or stern of a vessel below the decks.
<b>PEAK TANK</b>	Compartments at the extreme fore and aft ends of the ship for any use, either as void spaces or as trimming tanks. When used for the latter purpose, water is introduced to change the trim of the vessel.
<b>PEEN</b>	To round off or shape an object, smoothing out burrs and rough edges.
<b>PEEN</b>	The lesser head of a hammer, and is termed ball when it is spherical, cross when in the form of a rounded edge ridge at right angles to the axis of the handle, and straight when like a ridge in the plane of the handle.
<b>PELICAN HOOK</b>	A type of quick releasing hook used at the lower end of shrouds, on boat grips, and in similar work where fast work may be necessary.
<b>PILLAR</b>	A vertical member or column giving support to a deck. Also called a stanchion.
<b>PIN, BELAYING</b>	A small iron or tough wood pin, made with a head, shoulder, and shank. It is fitted in holes in a rail and is used in belaying or making fast the hauling parts of light running gear, signal halyards, etc.
<b>PINTLES</b>	A term applied to the pins or bolts which hinge the rudder to the gudgeons on the stern post.
<b>PITCH</b>	A term applied to the distance a propeller will advance during one revolution, the distance between the centers of the teeth of a gear wheel,

	the axial advance of one convolution of the thread on a screw, the spacing of rivets, etc. Also applied to pine tar, asphalt and coal pitch used in paying seams of a deck.
<b>PITCHING</b>	The alternate rising and falling motion of a vessel's bow in a nearly vertical plane as she meets the crests and troughs of the waves.
<b>PITTING</b>	The localized corrosion of iron and steel in spots, usually caused by irregularities in surface finish, and resulting in small indentations of pits.
<b>PIVOTING POINT</b>	That point during the progress of a launching at which the moment of buoyancy about the fore poppet equals the moment of the vessel's weight. At this point, the stern begins to lift and the vessel pivots about the fore poppet.
<b>PLATFORM</b>	A partial deck.
<b>PLATING, SHELL</b>	The plating forming the outer skin of a vessel. In addition to constituting a watertight envelope to the hull, it contributes largely to the strength of the vessel.
<b>PLIMSOLL MARK</b>	A mark painted on the sides of a vessel designating the depth to which the vessel may, under the maritime laws, be loaded in different bodies of water during various seasons of the year.
<b>POLARITY</b>	The property possessed by electrified bodies by which they exert forces in opposite directions. The current in an electrical circuit passes from the positive to the negative pole.
<b>PONTOON</b>	A scow-shaped boat used in connection with engineering and military operations such as transporting men and equipment, bridge construction, supports for temporary bridges, salvage work, etc. Also applied to cylindrical air and watertight tanks or floats used in salvage operations.
<b>POOP</b>	The structure or raised deck at the after end of a vessel.
<b>PORT</b>	The left-hand side of a ship when looking from aft forward. Also an opening.
<b>PROFILE</b>	A side elevation of a ship form.
<b>PROPELLER</b>	A propulsive device consisting of a boss or hub carrying radial blades, from two to four in number. The rear or driving faces of the blades form portions of an approximately helical surface, the axis of which is the center line of the propeller shaft.
<b>PROPELLER ARCH</b>	The arched section of the stern frame above the propeller.
<b>PROPELLER GUARD</b>	A framework fitted somewhat below the deck line on narrow, high-speed vessels with large screws so designed as to overhang and thus protect the tips of the propeller blades.
<b>PROW</b>	An archaic term for the bow of a ship.
<b>PUDDENING, PUDDING</b>	Pads constructed of old rope, canvas, oakum, etc., sometimes leather covered, in any desired shape and size and used to prevent chafing of boats, rigging, etc., on the stem of a boat to lessen the force of a shock.
<b>PURCHASE</b>	Any mechanical advantage which increases the power applied.



## Q

### **QUARTER**

The upper part of a vessel's sides near the stern; also portions of the vessel's sides about midway between the stem and mid-length and between mid-length and the stern. The part of a yard just outside the slings.

### **QUARTERS**

Living spaces for passengers or personnel. It includes staterooms, dining saloons, mess rooms, lounging places, passages connected with the foregoing, etc., individual stations for personnel for fire or boat drill, etc.

### **QUARTERDECK**

A raised upper deck at the aft end of a ship. It is usually a feature of smaller vessels.

### **QUAY**

An artificial wall or bank, usually of stone, made toward the sea or at the side of a harbor or river for convenience in loading and unloading vessels.

### **QUICK-ACTING CLEAT, BATTENING DEVICE**

A cleat applied manually by a lever to provide the necessary locking. Hatch covers are secured to the coaming by quick-acting cleats. The cleat consists of an I-bolt and a cam. The length of the cleat is adjusted by a nut. The necessary resilience is produced by a rubber washer being compressed in-between steel washers.

## R

<b>RACKING</b>	Deformation of the section of a ship, generally applied to a transverse section, so that one set of diagonals in the plane of action is shortened while those at right angles hereto, are lengthened. A distortion of the hull structure caused by a strain from a disturbed sea.
<b>RAIL</b>	The upper edge of the bulwarks. Also applied to the tiers of guard rods running between the top rail and the deck where bulwarks are not fitted.
<b>RAKE</b>	A term applied to the fore and aft inclination from the vertical of a mast, smokestack, stem-post, etc.
<b>RAM</b>	A hydraulically-operated piston which seals off a well when the blowout preventer is actuated. The piston rod of a hydraulic cylinder, as in a ram-type hatch operating system and/or steering gear.
<b>REEVING</b>	The act of passing the end of a rope or chain through an opening, as passing a rope through a block.
<b>RIDER PLATE</b>	A continuous flat plate attached to the top of a center line vertical keel in a horizontal position. Its underside is attached to the floors, and when an inner bottom is fitted, it forms the center strake.
<b>RIGGING</b>	A term used collectively for all the ropes and chains employed to support the masts, yards, and booms of a vessel, and to operate the movable parts of same.
<b>RISER</b>	The upright board of a stair. A pipe extending vertically and having side branches.
<b>RISINGS</b>	The fore and aft stringers inside a small boat, secured to the frames, and on which the thwarts rest.
<b>ROLL</b>	Motion of the ship from side to side, alternately raising and lowering each side of the deck. The oscillating motion of a vessel from side to side due to ground swell, heavy sea, or other causes.
<b>ROPE</b>	The product resulting from twisting a fibrous material, such as manila, hemp, flax, cotton, coir, etc., into yarns or threads which in turn are twisted into strands and several of these are laid up together. Fiber rope is designated as to size by its circumference. Wire rope is made of iron, steel, or bronze wires, with or without a fiber core or heart, twisted like yarns to form strands which are laid up to form the rope. Wire rope is designated as to size both by its diameter and by its circumference.
<b>ROPE LAY</b>	The direction in which a rope is twisted up.
<b>RUBBING STRIP</b>	A plate riveted to the bottom of the keel to afford protection in docking and grounding. A strip fastened to the face of a fender or to the shell plating where contact is likely to occur.
<b>RUDDER</b>	A device used in steering or maneuvering a vessel. The most common type consists of a flat slab of metal or wood, hinged at the forward end to the stern or rudder post. When made of metal, it may be built up from plates, shapes, and castings, with or without wood filling, or it may be a casting. The rudder is attached to a vertical shaft called the rudder stock, by which it is turned from side to side.
<b>RUDDER BLADE</b>	The main part of the rudder which provides the necessary surface for the impinging action and the side pressure of the water. A streamlined rudder blade consists of side plates stiffened by internal vertical and horizontal web plates and solid parts in cast steel, which makes the housing of the rudder stock and the pintle.

**RUDDER, BALANCED**

A rudder having the leading edge of a whole or a part of its areas forward of the center line of the rudder stock, thus advancing the center of pressure of the water on the rudder and reducing the torque.

**RUDDER FRAME**

A term applied to a vertical main piece and the arms that project from it which form the frame of the rudder. It may be a casting, a forging, or a weldment.

**RUDDER STOCK**

A vertical shaft having a rudder attached to its lower end and having a yoke, quadrant, or tiller fitted to its upper portion by which it may be turned.

**RUDDER TRUNK**

A watertight casing fitted around a rudder stock between the counter shell plating and a platform or deck, usually fitted with a stuffing box at the upper end.

**RUST**

A visible corrosion product consisting of hydrated iron oxides. Rust is formed on steel surfaces exposed to moist atmospheric conditions.

**RUST GRADES**

According to Swedish Standard 055900-1967:

**Grade A**

Steel surface covered completely with adhering mill scale and with little or no rust.

**Grade B**

Steel surface which has started to rust and form, with the mill scale beginning to flake.

**Grade C**

Steel surface where the mill scale has rusted away or form, which can be scraped away with a little pitting visible to the naked eye.

**Grade D**

Steel surface where the mill scale has rusted away and where pitting is visible to the naked eye.

Grade A is normally the condition of the steel surface a short time after rolling.

Grades B, C and D are normally the state of the surface after it has been exposed to the outdoors, without protection against rusting in a fairly corrosive atmosphere for 2 or 3 months, then a year or so and about 3 years, respectively.

## S

<b>SACRIFICIAL ANODE</b>	The anode made of metal less noble than steel in the galvanic series (i.e. zinc or aluminium).
<b>SAFE WORKING LOAD (SWL)</b>	The SWL for shipboard lifting appliances and heavy lift cranes, is the load that each complete crane assembly is approved to lift on the cargo hook, excluding the weight of the gear (hook, block, wire, etc.).
<b>SAGGING</b>	The deformation or yielding caused when the middle portion of a structure or ship settles or sinks below its designed or accustomed position. The reverse of hogging.
<b>SAMSON POST</b>	A strong vertical post that supports cargo booms. See king posts.
<b>SCANTLINGS</b>	A term applied to the dimensions of the frames, girders, plating, etc., that enter into a ship's structure.
<b>SCREEN BULKHEAD</b>	A light bulkhead used as a shelter from an excess of heat, cold, or light, or to conceal something from sight.
<b>SCUPPER PIPE</b>	A pipe conducting the water from a deck scupper to a position where it is discharged overboard.
<b>SCUPPERS</b>	Drains from decks to carry off accumulations of rain or sea water. The scuppers are placed in the gutters or waterways on open decks and in corners of enclosed decks, and connect to pipes leading overboard.
<b>SCUTTLE</b>	A small opening, usually circular in shape and generally fitted in decks to provide access. Often termed escape scuttles, and when fitted with means whereby the covers can be removed quickly to permit exist, are called quick-acting scuttles.
<b>SEA CHEST</b>	An arrangement for supplying sea water to condensers and pumps, and for discharging waste water from the ship to the sea. It is a cast fitting or a built-up structure located below the waterline of the vessel and having means for attachment of the piping. Suction sea chests are fitted with strainers or gratings.
<b>SEA COCK, CONNECTION</b>	<b>SEA</b> A sea valve secured to the plating of the vessel below the waterline for use in flooding tanks, magazines, etc., to supply water to pumps, and for similar purposes.
<b>SEAM</b>	A term applied to an edge joint. Fore and aft joint of shell plating, deck and tank top plating, or a lengthwise edge joint of any plating.
<b>SEAMSTRAP</b>	A term applied to a strip of plate serving as a connecting strap between the butted edges of plating. Strap connections at the ends are called butt-straps.
<b>SEARCHLIGHT</b>	A powerful electric lamp placed at the focus of a mirror, which projects the light in a beam of parallel rays.
<b>SERVE</b>	To wrap any small stuff tightly around a rope which has been previously wormed and parceled. Very small ropes are not wormed.
<b>SET, PERMANENT SET</b>	The permanent deformation resulting from the stressing of an elastic material beyond its elastic limit.
<b>SET UP</b>	To tighten the nut on a bolt or stud; to bring the shrouds of a mast to a uniform and proper tension by adjusting the rigging screws or the lanyards through the dead eyes.
<b>SHACKLE</b>	U-shaped steel forging with a pin through an eye on each leg of the U.
<b>SHACKLE BOLT</b>	A pin or bolt that passes through both eyes of a shackle and completes the link. The bolt may be secured by a pin through each end, or a pin through one end and through the eye, or by having one end and one eye threaded or one end threaded and a pin through the other.

<b>SHAFT, SHAFTING</b>	The cylindrical forging, solid or tubular, used for transmission of rotary motion from the source of power, the engine, to the propellers.
<b>SHAFT ANGLE</b>	The angle between the center line of the shaft and the center line of the ship is the horizontal angle and the angle between the centerline of the shaft and either the base line or the designed waterline is the vertical angle.
<b>SHAFT BEARINGS</b>	Bearings which support the intermediate shafting between the tail shaft and the main engine or gearbox.
<b>SHAFT COUPLING</b>	The means of joining together two sections of a shaft, usually by means of bolts through flanges on the ends of the sections of the shafts.
<b>SHAFT TUNNEL</b>	A watertight enclosure for the propeller shafting, large enough to walk in. It extends aft from the engine room to provide access and protection to the shafting in way of the holds.
<b>SHAFT STRUT</b>	A term applied to a bracket supporting the outboard after end of the propeller shaft and the propeller in twin or multiple-screwed vessels having propeller shafts fitted off the center line. It usually consists of a hub or boss, fitted with a bushing, to form a bearing for the shaft, and two streamlined arms connecting it to the side of the ship. The inboard ends of the arms are fitted with palms for attachment to the shell or to interior framing.
<b>SHEAR LEGS</b>	A rig for handling heavy weights, consisting of an A-frame of timber or steel with the top overhanging the base, having the lower ends fixed or pivoted and the top ends held either by fixed stays or by topping lifts which permit change of slope of the legs. Tackles are secured at the top of the frame through which the hoisting rope or cable is run. Sometimes called sheers.
<b>SHEATHING</b>	A term applied to the wood planking fitted over the underwater portion of a steel hull, and to the copper or alloy sheets with which the bottom of a wood ship, or a steel ship sheathed with wood, is covered.
<b>SHEAVE</b>	A wood or metal disk, having a groove around its cylindrical surface to permit a rope or chain to run over it without slipping off and a bushing for bearing on the pin or bolt on which it revolves.
<b>SHEAVE HOLES</b>	A term applied to apertures in masts, booms, and spars in which sheaves are installed.
<b>SHEER</b>	The longitudinal curve of a vessel's rails, deck, etc., the usual reference being to the ship's side; however, in the case of a deck having a camber, its center line may also have a sheer. The amount by which the height of the weather deck at the after or forward perpendicular exceeds that at its lowest point.
<b>SHEER STRAKE</b>	The topmost continuous strake of the shell plating, usually made thicker than the side plating below it.
<b>SHELL DOOR</b>	Doors in the side shell can be seen on almost every type of ship and are used for various duties. The common ones are for passengers, pilot entry and for bunker hoses. The opening mechanism can be either sliding, top-hinged or side-hinged.
<b>SHELL EXPANSION</b>	A plan showing the shapes, sizes, and weights of all plates comprising the shell plating, and details of the connections.
<b>SHELTER DECK</b>	A term applied to a deck fitted from stem to stern on a relatively light superstructure.
<b>SHIPSHAPE</b>	A nautical term used to signify that the whole vessel, or the portion under discussion, is neat in appearance and in good order.
<b>SHORES</b>	Pieces of timber placed in a vertical or inclined position to support some part of a ship, or the ship itself, during construction or while in dry dock.

<b>SIDE PLATE</b>	A part of a hatch cover; the vertical plate forming the outer edge of each panel.
<b>SIDE PLATING</b>	A term applied to the plating above the bilge in the main body of a vessel. Also to the sides of deck houses, or to the vertical sides of enclosed plated structures.
<b>SKEG</b>	The extreme after part of the keel of a vessel, the portion that supports the rudder post and stern post.
<b>SLACK</b>	The opposite of taut; not fully extended as applied to a rope; to "slack away" means to pay out a rope or cable by carefully releasing the tension while still retaining control; to "slack off" means to ease up, or lessen the degree of tautness.
<b>SLEEVE</b>	A casing, usually of brass, fitted over line or other shafting for protection against wear or corrosion, or as a bearing surface.
<b>SLUICE</b>	An opening in the lower part of a bulkhead fitted with a sliding watertight gate, or small door, having an operating rod extending to the upper deck or decks. It is used to permit liquid in one compartment to flow into the adjoining compartment.
<b>SLUICE VALVE</b>	A large valve in which a rectangular or circular gate slides across the opening.
<b>SMIT BRACKET</b>	A fitting for securing the end length of a chafing chain, consisting of two parallel vertical plates mounted on a base with a sliding bolt passing through them.
<b>SOLE PLATE</b>	A plate fitted to the top of a foundation to which the base of a machine is bolted. Also a small plate fitted at the end of a stanchion.
<b>SOUNDING PIPE</b>	A vertical pipe in an oil or water tank, used to guide a sounding device when measuring the depth of liquid in the tank. Also called a sounding tube.
<b>SPAN</b>	The distance between any two similar members, as the span of the frames. The length of a member between its supports, as the span of a girder. A rope whose ends are both made fast some distance apart, the bight having attached to it a topping lift, tackle, etc. A line connecting two davit heads so that when one davit is turned, the other follows.
<b>SPAR</b>	A term applied to a pole serving as a mast, boom, gaff, yard, bowsprit, etc. Spars are made of both steel and wood.
<b>SPECIFIC GRAVITY</b>	The ratio of the weight of a given volume of any substance to the weight of an equal volume of distilled water. Since the distilled water weighs approximately 62.4 pounds per cubic foot, any substance, a cubic foot of which weighs less than this, has a specific gravity of less than one, and will float on water. Any substance of greater weight per cubic foot has a specific gravity of more than one and will sink. Specific gravity of gases is based in a like manner on the weight of air.
<b>SPECTACLE FRAME</b>	A single casting containing the bearings for an furnishing support for the ends of the propeller shafts in a twin screw vessel. The shell plating is worked outboard so as to enclose the shafts and is attached at the after end to the spectacle frame. Used in place of shaft struts.
<b>SPIKE</b>	A stout metal pin headed on one end and pointed at the other, made of either square or round bar, and used for securing heavy planks and timbers together.

<b>SPILING</b>	The curve of a plate or strake as it narrows to a point.
<b>SPLICE</b>	A method of uniting the ends of two ropes by first un-layering the strands, then interweaving them so as to form a continuous rope.
<b>SQUAT, SQUATTING</b>	The increase in trim by the stern assumed by a vessel when running at high speed over that existing when she is at rest. Ships squat is the overall decrease in the static under keel clearance, forward or aft, created by dynamical sinking of a ship when moving ahead. When a ship proceeds through water, she pushes water ahead of her. In order not to have a “ <i>hull</i> ” in the water, this volume of water must return down the sides and under the bottom of the ship. The stream lines of return flow are speeded up under the ship. This causes a drop in the pressure, resulting in the ship dropping vertically in the water.
<b>STABILITY</b>	The tendency which a vessel has to return to the upright position after the removal of an external force which inclined her away from that position. To have stability, a vessel must be in a state of stable equilibrium.
<b>STABILITY, RANGE OF</b>	The number of degrees through which a vessel rolls or lists before losing stability.
<b>STAGE</b>	A floor or platform of planks supporting workmen during the construction or the cleaning and painting of a vessel, located either inside or outside the vessel.
<b>STAGING</b>	Upright supports, fastened together with horizontal and diagonal braces forming supports for planks which form a working platform or stage.
<b>STANCHIONS</b>	Short columns or supports for decks, hand rails, etc. Stanchions are made of pipe, steel shapes, or rods, according to the location and purpose they serve.
<b>STANDING RIGGING</b>	Rigging that is permanently secured and that is not hauled upon, as shrouds, stays, etc.
<b>STAPLING</b>	Plates or angles fitted closely around or against continuous members passing through a watertight or oil-tight member and caulked or welded to maintain the water or oil tightness of the structure.
<b>STARBOARD</b>	The right-hand side of the ship when looking from aft forward. Opposite to port.
<b>STAYS</b>	The ropes, whether hemp or wire, that support the lower masts, topmasts, top-gallant masts, etc., in a fore and aft direction. Also a term for bulwarks and hatch coaming brackets.
<b>STEERING GEAR</b>	A term applied to the steering wheels, leads, steering engine, and fittings by which the rudder is turned.
<b>STEM</b>	The bow frame forming the apex of the intersection of the forward sides of a ship. It is rigidly connected at lower end to the keel.
<b>STERN</b>	The after end of a vessel; the farthest distant part from the bow.
<b>STERN FRAME</b>	A large casting or forging attached to the after end of the keel to form the ship’s stern. Includes rudder post, propeller post, and aperture for the propeller in single-screw vessels.
<b>STERN PIPES</b>	A round or oval casting, or frame, inserted in the bulwark plating at the stern of the vessel through which the mooring hawser or warping lines are passed. Also called stern chock.
<b>STERN POST</b>	The main vertical post in the stern frame upon which the rudder is hung. Also called the rudder post.

<b>STERN TUBE</b>	The bearing supporting the propeller where it emerges from the ship. It consists of a hollow cast-iron or steel cylinder fitted with brass bushings, which in turn are lined with lignum vitae, white metal, etc., bearing surfaces upon which the propeller shaft, enclosed in a sleeve, rotates.
<b>STIFF, STIFFNESS</b>	The tendency of a vessel to remain in the upright position, or a measure of the rapidity with which she returns to that position after having been inclined from it by an external force.
<b>STIFFENER</b>	An angle bar, T-bar, channel, etc., used to stiffen plating of a bulkhead, etc.
<b>STOCKS</b>	A general term applied to the keel blocks, bilge blocks, and timbers upon which a vessel is constructed.
<b>STOOL</b>	A structure supporting cargo hold and tank bulkheads.
<b>STOPPER</b>	A device for securing a mooring line temporarily at the ship's mooring winch whilst the free end is fastened to a ship's securing bitt.
<b>STRAKE</b>	A term applied to a continuous row or range of plates. The strakes of shell plating are usually lettered, starting with A at the bottom row or garboard strake.
<b>STRAKE, BILGE</b>	A term applied to a strake of outside plating running in the way of the bilge.
<b>STRAKE, BOTTOM</b>	Any strake of plating on the bottom of a ship that lies between the keel and the bilge strakes.
<b>STRENGTH MEMBER</b>	Any plate or shape which contributes to the strength of the vessel. Some members may be strength members when considering longitudinal strength but not when considering transverse strength, and vice versa.
<b>STRINGER</b>	A term applied to a fore-and-aft girder running along the side of a ship and also to the outboard strake of plating on any deck. The side pieces of a ladder or staircase into which the treads and risers are fastened.
<b>STRINGER PLATES</b>	A term applied to the outboard plates on any deck, or to the plates attached to the top flanges of a tier of beams at the side of a vessel.
<b>STRUM BOX</b>	The enlarged terminal on the suction end of a pipe which forms a strainer to prevent the entrance of material liable to choke the pipe. Also called Rose Box.
<b>STRUT</b>	A heavy arm or brace. Outboard column-like support or V-arranged supports for the propeller shaft used on some ships with more than one propeller instead of bossings.
<b>STUD</b>	A bolt threaded on both ends, one end of which is screwed into a hole drilled and tapped in the work, and is used where a through bolt cannot be fitted.
<b>STUD LINK</b>	Chain in which each link has a short distance piece (known as a stud) worked at its mid-length at right angles with its major axis. This is done in order to maintain the link shape.
<b>STUFFING BOX</b>	A fitting designated to permit the free passage or revolution of a rod or a pipe while controlling or preventing the passage by it of water, steam, etc.
<b>SUPERSTRUCTURE</b>	A structure built above the uppermost complete deck; a pilot house, bridge, galley house, etc.



**SURGE**  
**SWAGE**

A vessel's transient motion along her fore and aft axis.

To bear or force down. An instrument having a groove on its underside for the purpose of giving shape to any piece subjected to it when the swage is struck by a hammer.

**SWALLOW**

A term applied to the oval or round opening in a chock or mooring ring. See Block.

**SWASH BULKHEADS**

Longitudinal or transverse non-tight bulkheads fitted in a tank to decrease the swashing action of the liquid contents. Their function is greatest when the tanks are partially filled. Without them the unrestricted action of the liquid against the sides of the tank would be severe. A plate serving this purpose is called a swash plate.

**SWAY**

A vessel's motion from side to side.

**SWIVEL**

A special link constructed in two parts which revolve on each other, used to prevent fouling due to turns or twists in chains, etc.

## T

<b>TACKLE</b>	Any combination of ropes and blocks that multiplies power. Also applied to a single whip which does not multiply power but simply changes direction.
<b>TAFF RAIL</b>	The rail around the top of the bulwark or rail stanchions of the after end of the weather deck, be it upper, main, raised, quarter, or poop.
<b>TAIL SHAFT</b>	The aft section of the shaft which received the propeller.
<b>TANKS</b>	Compartments for liquids or gases. They may be formed by the ship's structure as double bottom tanks, peak tanks, deep tanks, etc., or may be independent of the ship's structure and installed on special supports.
<b>TANK TOP</b>	The plating laid on the bottom floors of a ship, which forms the top side of the tank sections or double bottom.
<b>TARPAULIN</b>	A term formerly applied to a Paulin which was usually tarred. A waterproof canvas covering for a hatch or other purpose.
<b>TAUT</b>	The condition of a rope, wire or chain when under sufficient tension to cause it to assume a straight line, or to prevent sagging to any appreciable amount.
<b>TELEGRAPH</b>	An apparatus, either electrical or mechanical, for transmitting orders, as from a ship's bridge to the engine room, steering gear room, or elsewhere about the ship.
<b>TEMPLATE</b>	A mold or pattern made to the exact size of a piece of work that is to be laid out or formed, and on which such information as the position of rivet holes, size of laps, etc., is indicated.
<b>THWARTS</b>	Boards extending across a rowboat just below the gunwale to stiffen the boat and to provide seats.
<b>TILLER</b>	An arm, attached to the rudder stock, which turns the rudder.
<b>TOE</b>	The edge of a flange on a bar.
<b>TOGGLE PIN</b>	A pin having a shoulder and an eye worked on one end, called the head, and whose other end, called the point, has its extremity hinged in an unbalanced manner so that after being placed through a hole, it forms a T-shaped locking device to keep the pin from working out or being withdrawn without first bringing the hinged portion into line with the shaft of the pin.
<b>TONGUE AND GROOVE</b>	The term applied to a plank or board which has one edge cut away to form a projection, or tongue, and the opposite edge cut out to form a groove, the tongue of one plank fitting into the groove of the adjoining plank.
<b>TONNAGE, GROSS</b>	The entire internal cubic capacity of a vessel expressed in "tons" taken at 100 cubic feet each. The peculiarities of design and construction of the various types of vessels and their parts necessitate certain explanatory rulings in connection with this term.
<b>TONNAGE, NET</b>	The internal cubic capacity of a vessel which remains after the capacities of certain specified spaces have been deducted from the gross tonnage. Tonnage should not be confused with displacement.
<b>TOPSIDE</b>	That portion of the side of the hull which is above the designed waterline; on or above the weather deck.
<b>TRACKWAYS</b>	The rails fitted to the hatch coaming to allow the hatch cover operating wheels to run on.
<b>TRANSOM</b>	A seat or couch built at the side of a stateroom or cabin, having lockers (transom lockers) or drawers underneath.

<b>TRANSOM, BOARD</b>	<b>TRANSOM</b>	The board forming the stern of a square-ended row boat or small yacht.
<b>TRANSOM FRAME</b>		The last transverse frame of a ship's structure. The cant frames, usually normal to the round of the stern, connect to it.
<b>TRANSOM STERN</b>		A square-ended stern used to provide additional hull volume and deck space at the after end.
<b>TRANSVERSE</b>		At right angles to the ship's fore-and-aft center line.
<b>TRANSVERSE FRAMES</b>		Vertical athwartship members forming the ribs.
<b>TREADS</b>		The steps or horizontal portions of a ladder or staircase upon which the foot is placed.
<b>TRIM</b>		The arithmetic sum of the draughts forward and aft above and below the mean waterline. The angle of trim is the angle between the plane of floatation and the mean waterline plane. A vessel "trims by the head" or "trims by the stern" when the vessel inclines forward or aft so that her plane of floatation is not coincident with her mean waterline plane. See Drag.
<b>TRIPPING BRACKETS</b>		Flat bars or plates placed at various points on deck girders, stiffeners, or beams as a reinforcement to prevent their free flanges from tipping.
<b>TRUNK</b>		A vertical or inclined shaft formed by bulkheads or casings, extending one or more deck lengths, around openings in the deck, through which access can be obtained, cargo, stores, etc., handled, or ventilation provided without disturbing or interfering with the contents or arrangements of the adjoining spaces.
<b>TUMBLE HOME</b>		The decreasing of a vessel's beam above the waterline as it approaches the rail. Opposite of flare.
<b>TURNBUCKLES</b>		Used to pull objects together. A link into whose opposite ends two threaded bars, one left-handed, the other right-handed, are inserted.
<b>TWEEN DECKS</b>		The upper cargo stowage compartments or the space between any two adjacent decks.

## U

### **ULLAGE**

The distance from the top of the hatch, or from the top of the inspection cover in the hatch, down to the surface of oil in the cargo tanks of an oil tanker. A short steel graduated rod attached to the end of a measuring tape is dropped down until the rod touches or goes part the way into the surface of the oil. The corresponding capacity tables are known as ullage tables. This method of measuring a quantity of oil in a tank is also adopted when conducting bunker surveys, if soundings are not possible.

### **UNSHIP**

### **UPPER DECK**

### **UPPER WORKS**

To remove anything from its accustomed or stowage place; to take apart. Generally applied to the uppermost continuous weather deck.

Superstructures or deck erections located on or above the weather deck. Sometimes applied to the entire structure above the waterline.

### **UPTAKE**

A sheet-metal conduit connecting the boiler smoke boy with the base of the smokestack. It conveys the smoke and hot gases from the boiler to the stack and is usually made with double walls, with an air space between to prevent radiation of heat into adjacent spaces.

**V**

<b>VALVE</b>		A mechanical device used for controlling or shutting off the passage of a fluid or gas into or out of a container or through a pipeline.
<b>VALVE CAGE</b>		A cylinder fitted with ports in which a valve plug moves. The port openings are shaped to produce various flow characteristics for difference valves, e.g. linear or equal percentage.
<b>VALVE CHESTS</b>		Valve chests are a series of valves all built into a single block or a manifold. Various arrangements of suction and discharge connections are possible in this assembly.
<b>VALVE MANIFOLD</b>		Sometimes suction must be taken from one of many sources and discharged to other units of either the same or another group. A valve manifold is used for this type of operation.
<b>VANE</b>		A fly made of bunting and carried at the masthead or truck, which, being free to rotate on a spindle, indicates the direction of the wind.
<b>VENTILATION</b>		The process of providing fresh air to the various spaces and removing foul or heated air, gases, etc., from them. This may be accomplished by natural draft or by mechanical means. Ventilation is the circulation and refreshing of air in a space without necessarily a change of temperature.
<b>VENTILATORS, MOUTHED or COWL</b>	<b>BELL-</b>	Terminals on open decks in the form of a 90-degree elbow with enlarged or bell-shaped openings, so formed as to obtain an increase of air supply when facing the wind and to increase the velocity of air down the ventilation pipe.
<b>VENTILATOR HEAD</b>		A cover arrangement which is fitted over a ventilator to prevent the entry of rain, or seawater. It may also be used as a means of closure.
<b>VISCOSITY</b>		A measure of a fuel resistance to flow. The viscosity of a fuel is an indication of the ability to pump, treat, and atomize the fuel. The viscosity value of a fuel must always be associated with the temperature at which the viscosity was determined. The kinematic method of measuring the viscosity of a fuel is used; the kinematic centistroke (cSt = mm <sup>2</sup> /s) system of viscosity at 50 degree centigrade.
<b>VOID SPACE</b>		An enclosed space in the cargo area external to a cargo tank, other than a hold space, ballast space, oil fuel tank, cargo pump-room, pump-room or any space in normal use by ship's personnel.
<b>VOLUME DISPLACEMENT VOYAGE DATA RECORDER (VDR)</b>	<b>OF</b>	The total volume of water displaced by the ship.  A maritime "black box", VDR is usually a two-part system consisting of a data collecting unit and a protected storage unit which stores the retrieved data. The main component of the system is carried inside the ship and is connected to a deck-mounted protective capsule which houses a fixed high-capacity solid state memory block. The capsule is designed to withstand fire, deep sea pressure, shock and penetration. The data collecting unit continuously records 12-hours of onboard activity including date and time; ship position; speed; heading; bridge audio; ship VHF communications relating to the operations; radar information showing actual radar picture at the time of recording; depth under the keel; rudder angle; engine order and response; hull opening status; watertight and fire door status; hull stress monitoring; wind speed and direction.

## W

<b>WAKE</b>	Moving forward, a ship imparts the forward motion to the water at the stern. It is known as the <i>WAKE</i> .
<b>WARP</b>	A light hawser or tow rope; to move a vessel along by means of lines or warps secured to some fixed object.
<b>WARPING HEAD, WARPING END, GYPSY HEAD</b>	A cylinder-like fitting at the end of winch or windlass shafts. The fibre mooring line or wire rope is hauled or slackened by winding a few turns around it, the free end being held taut manually as it rotates. Warping ends are used mostly for auxiliary purposes such as hauling ropes across a deck or for handling additional mooring ropes.
<b>WASH</b>	The waved and ripples spreading out from a vessel when underway.
<b>WASH BULKHEAD</b>	A perforated bulkhead fitted into a cargo or deep tank to reduce the sloshing or the movement of liquid through the tank.
<b>WASH PLATES</b>	Plates fitted fore and aft between floors to check the rush of bilge water from side to side when the ship is rolling.
<b>WATER LINE</b>	A term used to describe a line drawn parallel to the molded base line and at certain height above it, as the 10-foot water line. It represents a plan parallel to the surface of the water when the vessel is floating on an even keel, i.e. without trim. In the body plan and the sheer plan, it is a straight line, but in the plan view of the lines it shows the contour of the hull line at the given distance above the base line. Used also to describe the line of intersection of the surface of the water with the hull of ship at any draught and any condition of trim.
<b>WATERTIGHT</b>	Capable of preventing the passage of water through the structure in either direction with a proper margin of resistance under the pressure due to the maximum head of water which it might have to sustain.
<b>WATERTIGHT COMPARTMENT</b>	A space or compartment within a ship having its top, bottom and sides constructed in such a manner so as to prevent the leakage of water into or from the space unless the compartment is ruptured.
<b>WATERTIGHT DOOR</b>	A door which is fitted in a watertight bulkhead and able to open vertically or horizontally. It is operated by a hydraulic mechanism either locally or remotely. It must be substantially constructed and able to withstand the total hydraulic pressure of the adjoining compartment if it floods.
<b>WEATHER DECK</b>	A term applied to the upper, awning, shade, or shelter deck, or to the uppermost continuous deck, exclusive of forecastle, bridge or poop, this is exposed to the weather.
<b>WEB</b>	The vertical portion of a beam; the athwartship portion of a frame; the portion of a girder between the flanges.
<b>WEB FRAME</b>	A built-up frame to provide extra strength consisting of a web plate with flanges on its edges, placed several frame spaces apart, with the smaller, regular frames in-between.
<b>WEB PLATES</b>	A wide girder plate as in a web frame or hatch beam. Angle bars are usually fitted on each deck.
<b>WEDGES</b>	Wood or metal pieces shaped in the form of a sharp V, used for driving up or for separating work. They are used in launching to raise the vessel from the keel blocks and thus transfer the load to the cradle and the sliding ways.

**WELL**

1. Space in the bottom of a ship to which bilge water drains so it may be pumped overboard.
2. Any area on the deck exposed to the weather, where water may be entrapped. Wells are considered to be deck areas bounded on two or more sides by deck structures.

**WHEELHOUSE**

An enclosed space in which the main steering wheel, controls, engine room telegraph, etc., are located.

**WINCH**

A hoisting or pulling machine fitted with a horizontal single or double drum. A small drum is generally fitted on one or both ends of the shaft supporting the hoisting drum. These small drums are called gypsies, nigger-heads, or winch heads. The hoisting drums are either fitted with a friction brake or are directly keyed to the shaft. The driving power is usually steam or electricity, but hand power is also used. A winch is used principally for the purpose of handling, hoisting, and lowering cargo from a dock or lighter to the hold of a ship and vice-versa.

**WIND AND WATER  
STRAKES  
WINDLASS**

The strakes of the side shell plating between the ballast and the deepest load waterline.

An apparatus in which horizontal or vertical drums or gypsies and wildcats are operated by means of a steam engine or motor for the purpose of handling heavy anchor chains, hawsers, etc.

**WING**

An extension on the side of a vessel. A “*bridge wing*” is an extension of the bridge to both sides, intended to allow bridge personnel a full view to aid in the maneuvering of the ship.

**WORM, PARCEL AND  
SERVE**

To protect a section of rope from chafing by:

Laying yarns (worming) to fill in the cantlines, wrapping marine or other small stuff (serving) around it and stitching a covering of canvas (parceling) overall.

**WRINKLING**

Slight corrugations or ridges and furrows in a flat plate due to the action of compressive or shear forces.

## Y

### **YARD**

1. The horizontal spar from which a square sail is suspended. Note to be mistaken for yardarm.
2. The spar from which a quadrilateral fore-and-aft sail like a spanker or lugsail, is suspended.
3. An area where boats are built, stored or repair. A term applied to a spar attached at its middle portion to a mast and running athwartship across a vessel as a support for a square sail, signal halyards, lights, etc.

### **YARDARM**

The very end of a yard. Often mistaken for a “yard”, which refers to the entire spar; as in to hang “from the yardarm”.

### **YARD NUMBER**

Each shipyard typically numbers the ships that it has built in consecutive order. One use is to identify the ship before a name has been chosen.

### **YAW**

A vessel’s motion rotating about the vertical axis, so the bow rotates from side to side. Compare to Pitch, Roll, Headway, Sternway, Leeway, Drift, Surge, and Heave.

### **YAWING**

T turn from side to side on an uneven course.

### **YOKE**

A frame or bar having its center portion bored and keyed or otherwise constructed for attachment to the rudder stock. Steering leads to the steering gear are connected to each end of the yoke for the purpose of turning the rudder. Yoke lanyards are lines extending from the ends of the yoke to the stern sheets of a small boat for use in steering.

## Z

### **ZINC**

A hard, white metal with a good resistance to atmospheric corrosion. It is used as a coating for steel in a process called galvanizing and also as an alloying element.

### **ZINC PRIMER**

Common corrosion inhibiting primer used to coat bare steel prior to subsequent paint coating being applied.

### **ZULU TIME**

The difference between local time and Greenwich Meridian Time or Greenwich Mean Time (GMT). Zulu time is sometimes denoted by the letter “Z”, reference to the equivalent nautical time zone (GMT), which has been denoted by a Z since about 1950. Since the NATO phonetic alphabet and amateur radio word for Z is “Zulu”, UTC is sometimes known as Zulu time. This is especially true in aviation, where Zulu is the universal standard. This ensures everyone, regardless of location, is using the same 24-hour clock, thus avoiding confusion when navigating between time zones.