

**T.C.
MİLLÎ EĞİTİM BAKANLIĞI**

GEMİ YAPIMI ALANI

GEMİ YAPI ELEMANLARI (İNGİLİZCE)

Ankara, 2012

- Bu modül, mesleki ve teknik eğitim okul/kurumlarında uygulanan Çerçeve Öğretim Programlarında yer alan yeterlikleri kazandırmaya yönelik olarak öğrencilere rehberlik etmek amacıyla hazırlanmış bireysel öğrenme materyalidir.
- Millî Eğitim Bakanlığınca ücretsiz olarak verilmiştir.
- PARA İLE SATILMAZ.

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AÇIKLAMALAR

| | |
|--|--|
| ALAN | Gemi Yapımı Alanı |
| DAL/MESLEK | Alan Ortak |
| MODÜLÜN ADI | Gemi Yapı Elemanları (İngilizce) |
| MODÜLÜN TANIMI | Gemi yapı elemanlarını ve gemi ekipmanlarını teknik yabancı dille (İngilizce) ifade edebilme ile ilgili bilgi ve becerilerin verildiği öğrenme materyalidir. |
| SÜRE | 40/32 |
| ÖN KOŞUL | Gemi Bilgisi modül bilgisine sahip olmak. Temel düzeyde İngilizce bilgisi (A2 düzeyinde) |
| YETERLİK | Gemi yapı elemanları bilgilerini İngilizce okumak ve yazmak |
| MODÜLÜN AMACI | Genel Amaç Öğrenci , gerekli ortam sağlandığında tekniğe uygun olarak gemi yapı elemanlarını yabancı dille ifade edebileceksiniz. Amaçlar 1. Tekniğe uygun, gemi yapım elemanları imalatında kullanılan makine ve araç gereçleri yabancı dille ifade edebilecektir. 2. Tekniğe uygun,gemi yapı elemanlarını yabancı dille ifade edebilecektir. |
| EĞİTİM ÖĞRETİM ORTAMLARI VE DONANIMLARI | Ortam: Bireysel Öğrenme Ortamı, Gemi Yapımı Atölyesi, Bilgisayar Laboratuvar Ortamı, Alan Gezileri Ortamı, Sunumlar Donanım: Yabancı Dil Sözlüğü, Yardımcı Teknik Kitaplar, Bilgisayar, Yansıtım cihazı, Yazıcı, |
| ÖLÇME VE DEĞERLENDİRME | Her öğrenme faaliyeti sonunda kendinizi değerlendirebileceğiniz ölçme araçları yer almaktadır. Ayrıca öğretmeniniz tarafından hazırlanan ölçme araçları ile modül sonunda değerlendirmeye tabi tutulacaksınız. |

INTRODUCTION

Dear Student,

As a result of the economical and technological developments, English have become a lingua franca which is used all around the world. Due to globalization it has been an necessity to know English in order to catch the era, to keep up with the times and follow the scientific and technological developments. Therefore shipbuilding has made progress rapidly due to the technological developments. In this sector it is crucial to know English as a technical foreign language to improve the knowledge and experience.

Using English effectively which is to be learnt as a technical foreign language will ensure you to become more qualified employee in the shipbuilding sector.

In this module you will be able to express ship structure components and ship equipments in technical foreign language.

Knowing English as a technical foreign language is inevitable in order to be successful in the shipbuilding sector, to understand information and resources easily and to master the subject in this sector.

LEARNING ACTIVITY-1

AIM

At the end of this activity, you will have learnt the knowledge about the ship structure components.

RESEARCH

- Make an observation about the types of ships and write a report about them.
- Make a research about the ships and their structural components on the internet.
- Make an observation about the old ships around you (maritime museums, internet)

1. SHIP STRUCTURE COMPONENTS

1.1. The Ship Components In The Hull

- **Access Holes** cut in ship's structure to permit entering or leaving various compartments.



Figure 1.1: Access holes

- **Aft Peak Bulkhead** is a term applied to the first main transverse watertight bulkhead forward of the stern.
- **Bilge Keel** A fin fitted on the bottom of a ship at the bilge to reduce rolling. It commonly consists of a plate running fore and aft 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.



- **Beam** An athwart ship member supporting a portion of a deck. Also, the width of the ship.

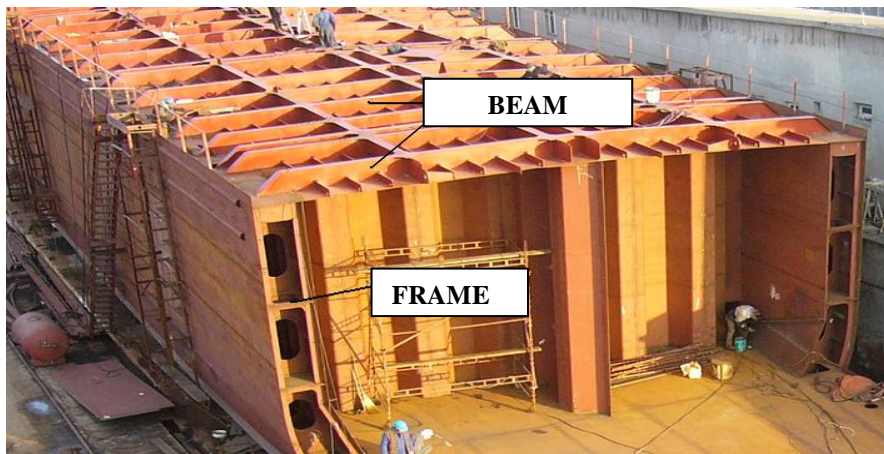


Figure 1.3: Beam

- **Bilge Strake** is the strake at the turn of bilge extending outward to a point where the side rises vertically.

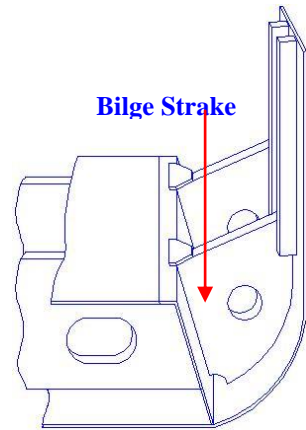


Figure 1.4: Bilge Strake

- **Bracket** A triangular plate used to connect rigidly two or more parts, such as a deck beam to a frame, a frame to a margin plate, etc.

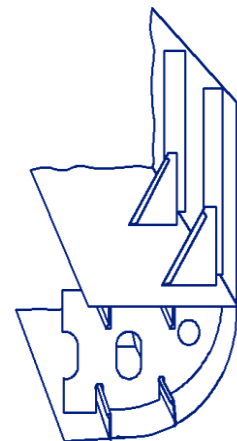
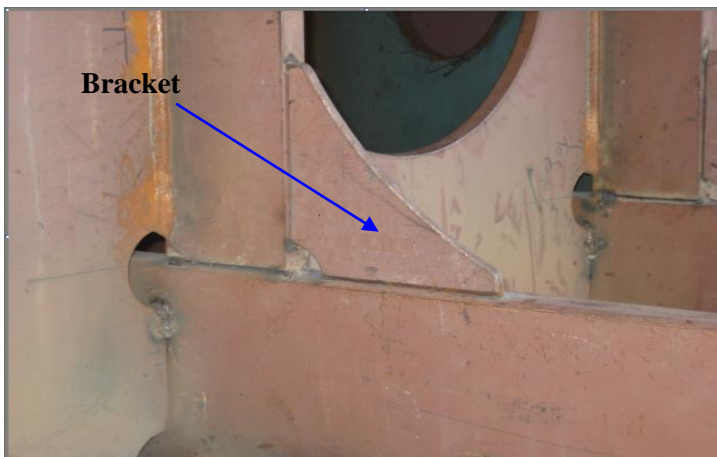


Figure 1.5: Bracket

- **Bulb Angle** : An angle shape, which is reinforced at one toe.



Figure 1.6: Bulb Angle

- **Bulb Plate** : A narrow plate reinforced on one edge.



Figure 1.7: Bulb plate

- **Bulkhead** : A vertical partition corresponding to the wall of a room, extending either athwart ships or fore and aft. A steel partition in a ship.
- **Bulkhead Deck** is the uppermost continuous deck to which transverse watertight bulkheads and shell are carried.
- **Bulkhead Structure** is the transverse or longitudinal bulkhead plating with stiffeners and girders.



Figure 1.8: Bulkhead structure

- **Bulwark** is the vertical plating immediately above the upper edge of the ship's side surrounding the exposed deck(s).

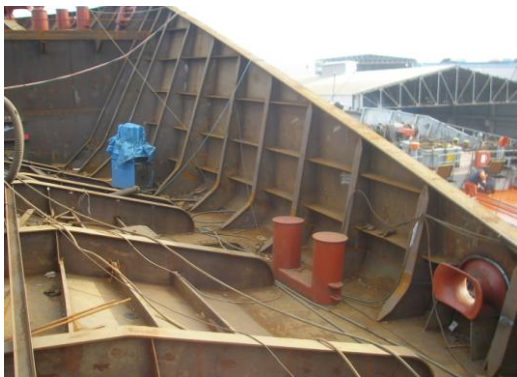


Figure 1.9: Bulwark

- **Cargo Hold Bulkhead** is a boundary bulkhead separating cargo holds.
- **Cofferdams** are spaces between two bulkheads or decks primarily designed as a safeguard against leakage of oil from one compartment to another.
- **Collision Bulkhead** is the foremost main transverse watertight bulkhead.
- **Centre Line** The middle line of the ship, extending from bow to stern .(from the beginning to the end).



Figure 1.10: Centreline

- **Deck** A part of a ship corresponding to the floor of a building.



Figure 1.11: Deck

- **Double Bottom** Compartments at the bottom of ship between inner and outer bottoms, used for ballast tanks, water, fuel, oil, etc.



Figure 1.12: Double Bottom

- **Doubling Plate** A plate fitted outside or inside of another to give extra strength or stiffness.
- **Floor** : The lower portion of a transverse frame, usually a vertical plate extending from centre line to bilge, and from inner to outer bottom.



Figure 1.13: Floor

- Forepeak is the area of the ship forward of the collision bulkhead.
- Freeboard Deck is normally the uppermost complete deck exposed to weather and sea.

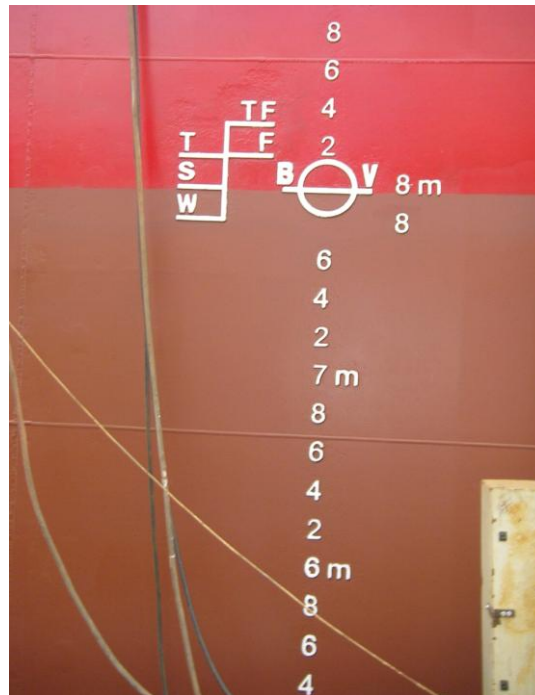


Figure 1.14: Freeboard Deck



Figure 1.15: Frame

- **Frames** Continuous frames combining side frames and floors.
- **Web Frame**, A heavy side or continuous frame, made with web plate for extra stiffness.
- **Girder** Fore and aft stiffening member for deck or bottom shell.



Figure 1.16: Girder

Gusset is a triangular plate, usually fitted to distribute forces at a strength connection between two structural members.

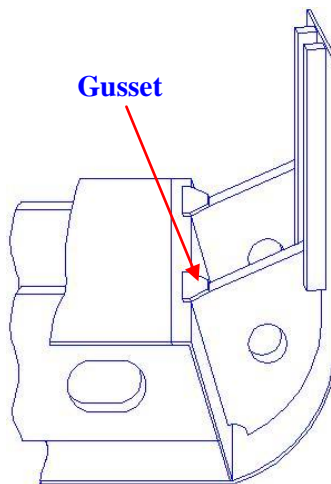


Figure 1.16: Gusset

- **Inner Bottom** Plating forming the upper surface of the double bottom. Also called tank top.
- **Inner Shell** A plated surface or "shell" inside the outer shell plating, used as additional protection in case of collision or other accidents. The space between the inner and outer shells is often used as a storage space for liquid ballast or cargo.
- **Keel** is the main structural member or backbone of a ship running longitudinal along centreline of bottom. Usually a flat plate stiffened by a vertical plate on its centreline inside the shell.

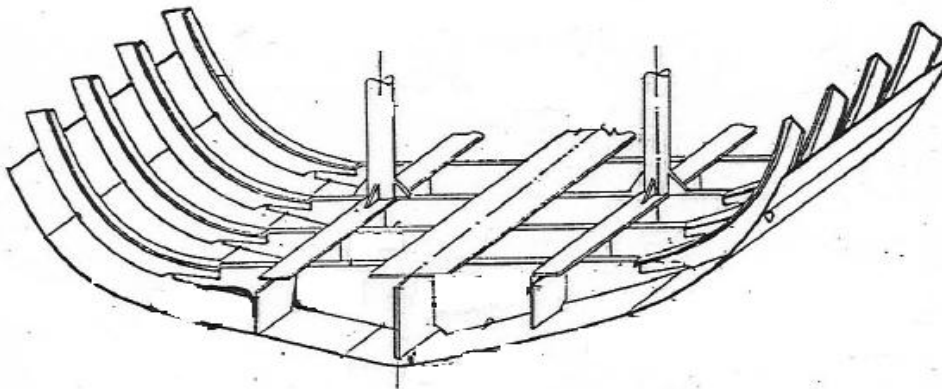


Figure 1.17: Keel

- **Margin Plate** is the outboard strake of the inner bottom and when turned down at the bilge the margin plate (or girder) forms the outer boundary of the double bottom.

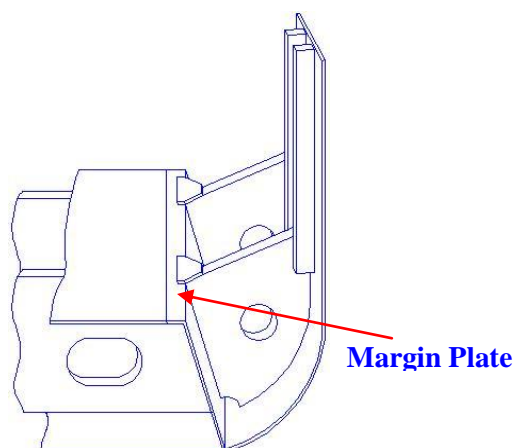


Figure 1.18: Margin plate

- **Manhole** A hole cut in a bulkhead, tank top, etc., to allow the passage of a man.

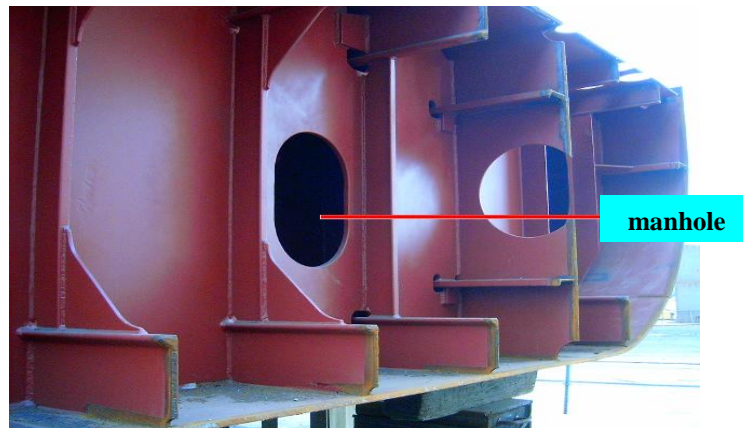


Figure 1.19: Manholes

- **Midship Section** A cross section through the ship, midway between the forward and after perpendiculars.

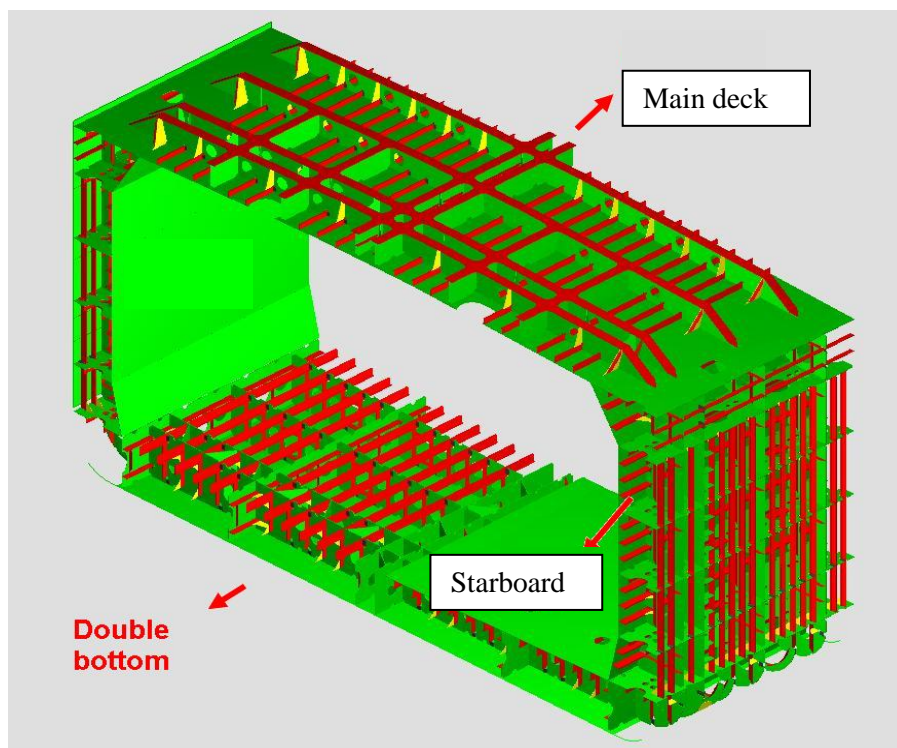


Figure 1.20: Midship Section

- **Pillar** vertical member or column which provides support to a deck girder. (Also termed a stanchion.)



Figure 1.21: Pillar

- **Pipe Tunnel** : A pipe tunnel which goes from the bow to stern in the double bottom tanks
- **Sheer** Curvature of deck in a fore and aft direction as seen in profile.



Figure 1.22: Sheer

- **Shell Expansion** A plan showing details of all shell plating and shell longitudinal. (Longitudinal would appear only on tankers)

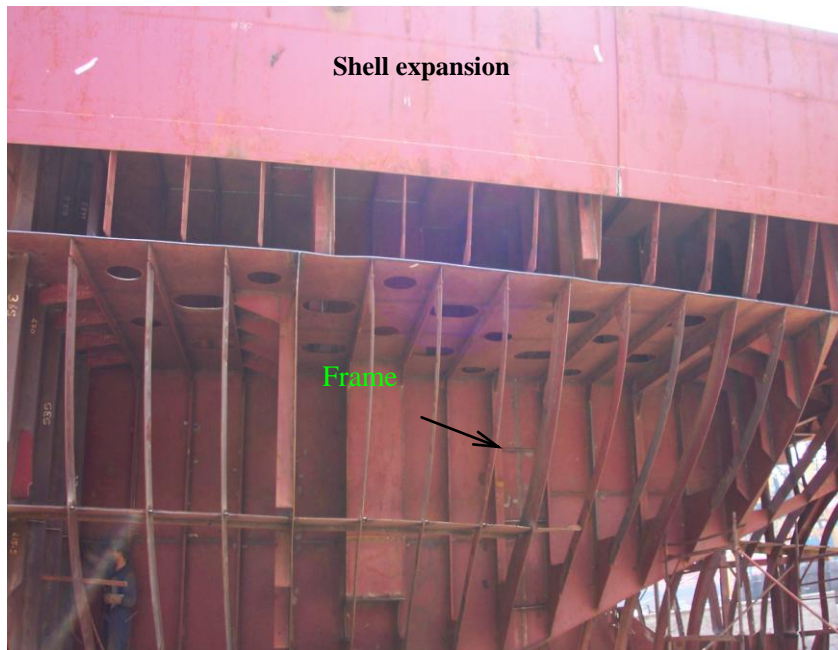


Figure 1.23: Shell

- **Shell Plating** The plates forming the outer skin of the hull.
- **Stiffener** An angle bar, T-bar, channel, etc., used to stiffen plating of a bulkhead or other member.

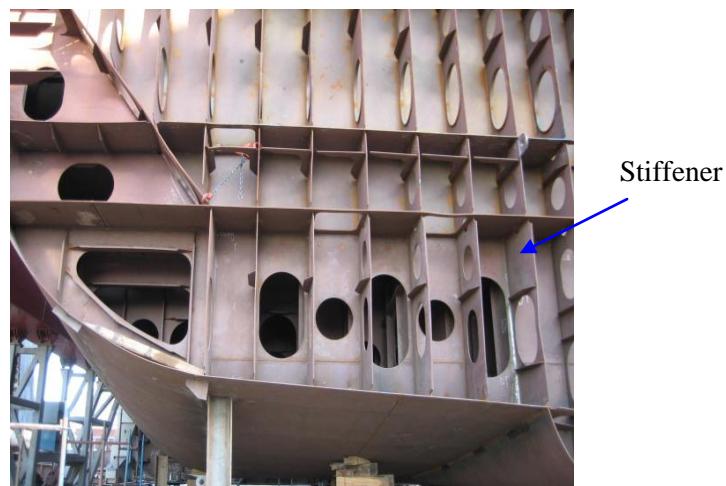


Figure 1.24: Stiffener

- **Stringer** A fore and aft member used to give longitudinal strength. Depending on location, these are called hold stringers, bilge stringers, side stringers, etc.

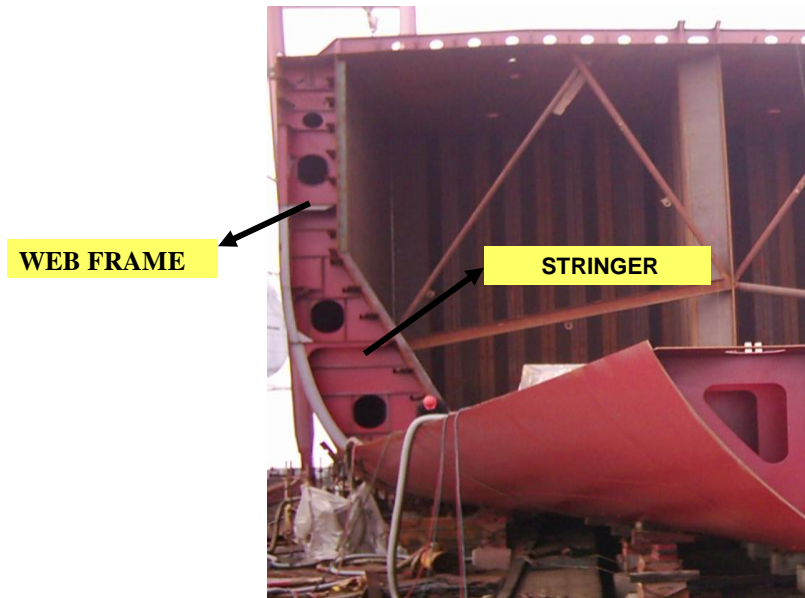
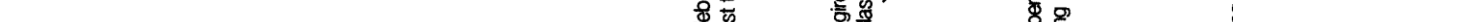


Figure 1.25: Stringer

- **Tank Top** : The plating over the double bottom.
- **Watertight Bulkhead** is a collective term for transverse bulkheads required for subdivision of the hull into watertight compartments.



iii. *How do you think the current situation in the world will change in the next 10 years?*

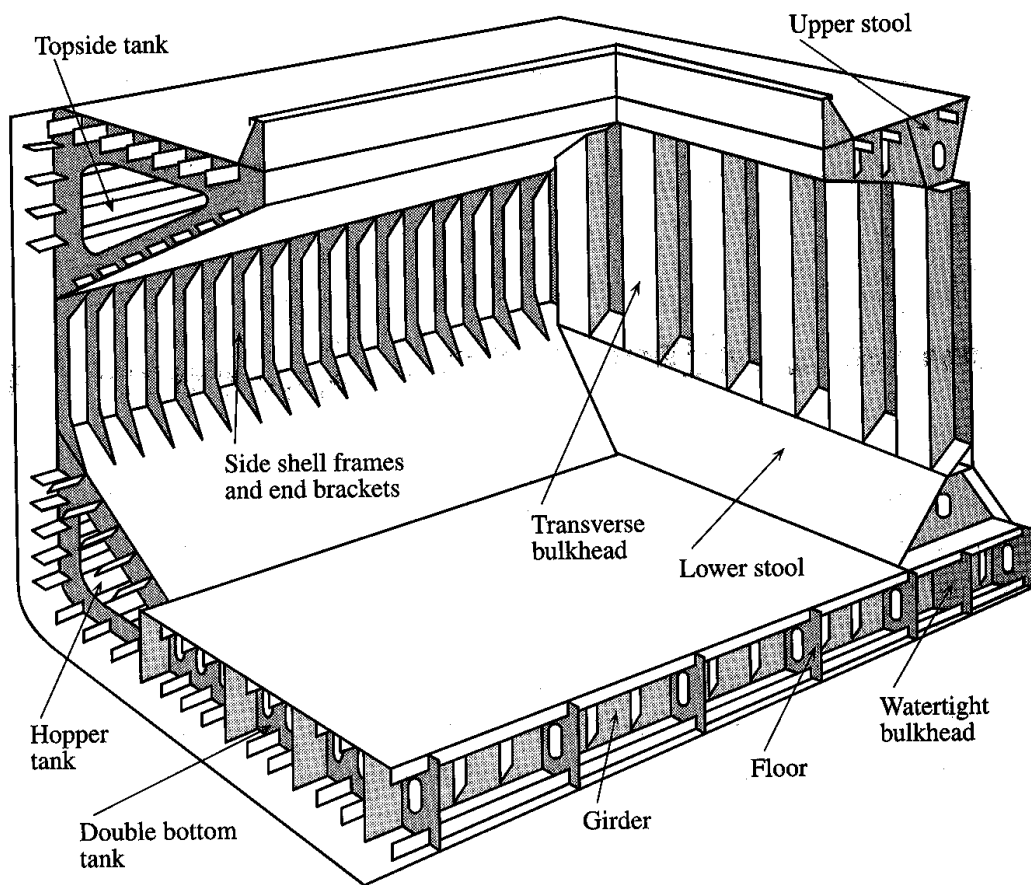


Figure 1.27: Ship Structure Components

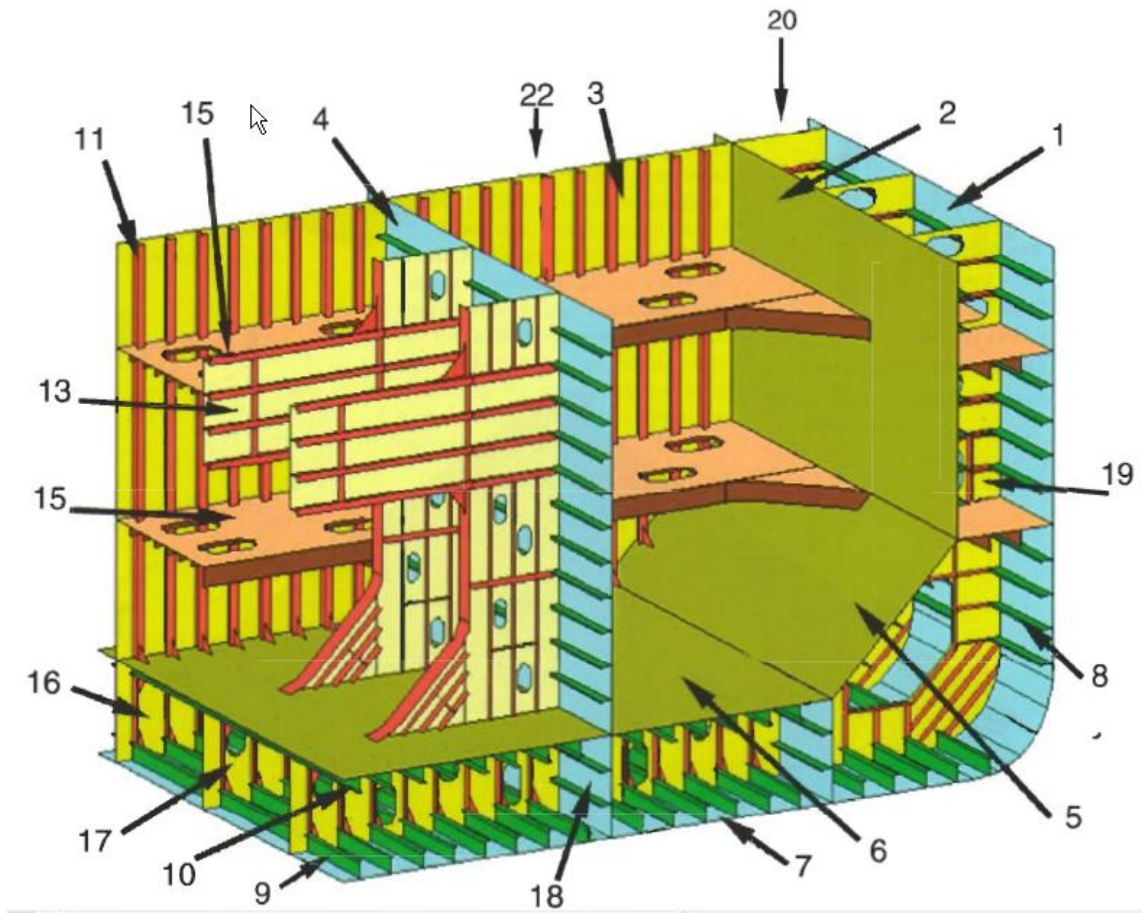


Figure 1.28: Ship Structure Components

| | | |
|--------------------------|--------------------------------|---------------------------------------|
| 1. Shell | 9. Bottom frame / Longitudinal | 17. Full floor |
| 2. Longitudinal bulkhead | 10. Inner bottom longitudinal | 18. Watertight side keelson |
| 3. Transverse bulkhead | 11. Bulkhead stiffener | 19. Web frame |
| 4. Longitudinal bulkhead | 12. Stiffener with brackets | 20. Wing ballast tank |
| 5. Lower hopper | 13. Tie beam or cross-tie | 21. Double bottom (of the inner hull) |
| 6. Tank top | 14. Stringer | 22. Cargo tank |
| 7. Bottom | 15. Stringer deck | |
| 8. Side longitudinal | 16. Watertight floor | |

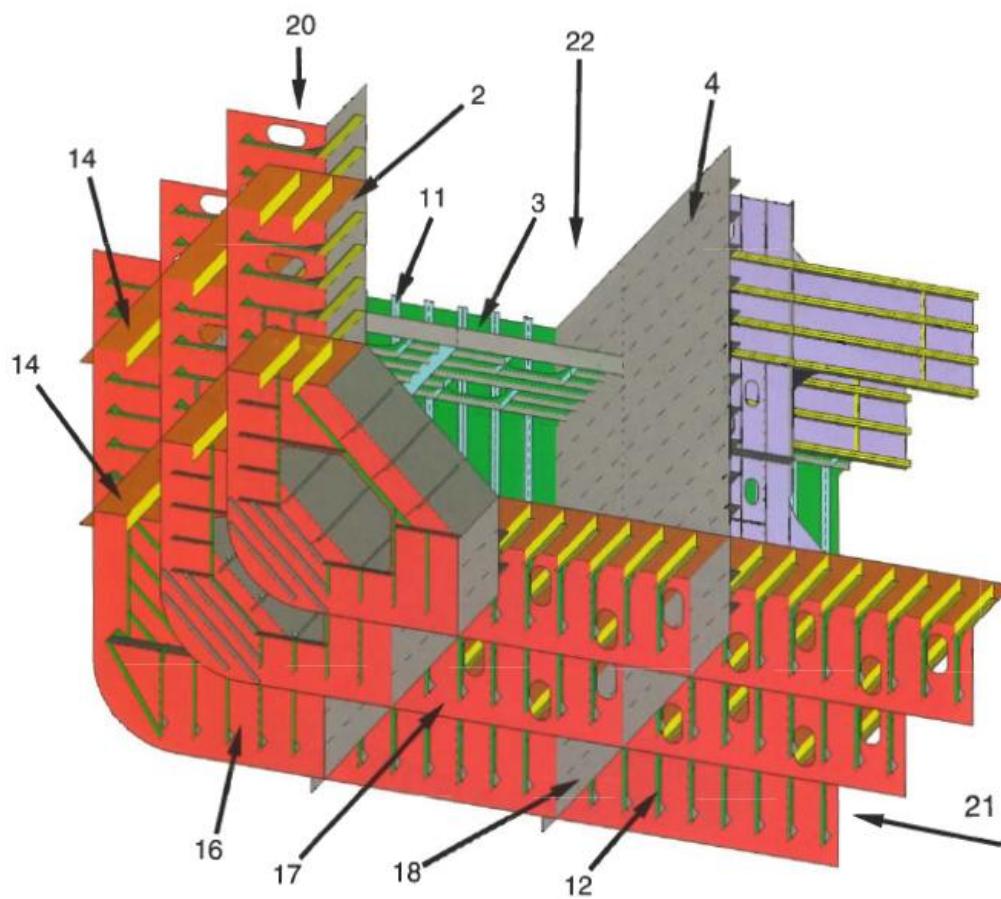


Figure 1.29: Ship Structure Components

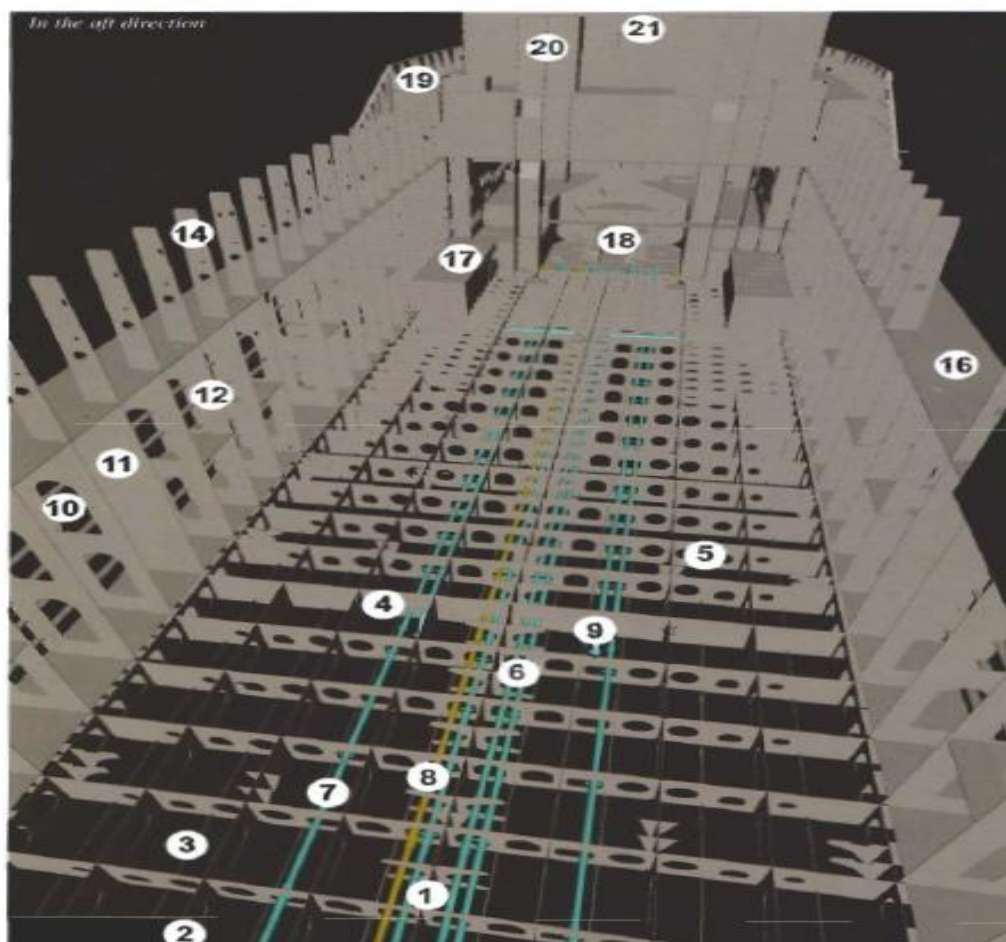


Figure 1.30: Ship Structure Components

| | |
|-----------------------------------|--|
| 1. Centre keelson | 2. Side keelson |
| 3. Bottom frame | 4. Water- or oil-tight floor (plate) |
| 5. Full floor (plate) | 6. Centre keelson bracket (dock bracket) |
| 7. Ballast line | 8. Bilge line |
| 9. End ballast line, with suction | 10. Longitudinal frame |
| 11. Water- or oil-tight bulkheads | 12. Web frame |
| 13. Hatch coaming | 14. Coaming stanchion |
| 15. Side bulkhead wing tank | 16. Gangway |
| 17. Ballast or fuel tank | 18. Top plate of engine seal |
| 19. Poopdeck | 20. Ventilation of the hold |
| 21. Accommodation front panel | 22. Collision bulkhead |
| 23. Breakwater | |

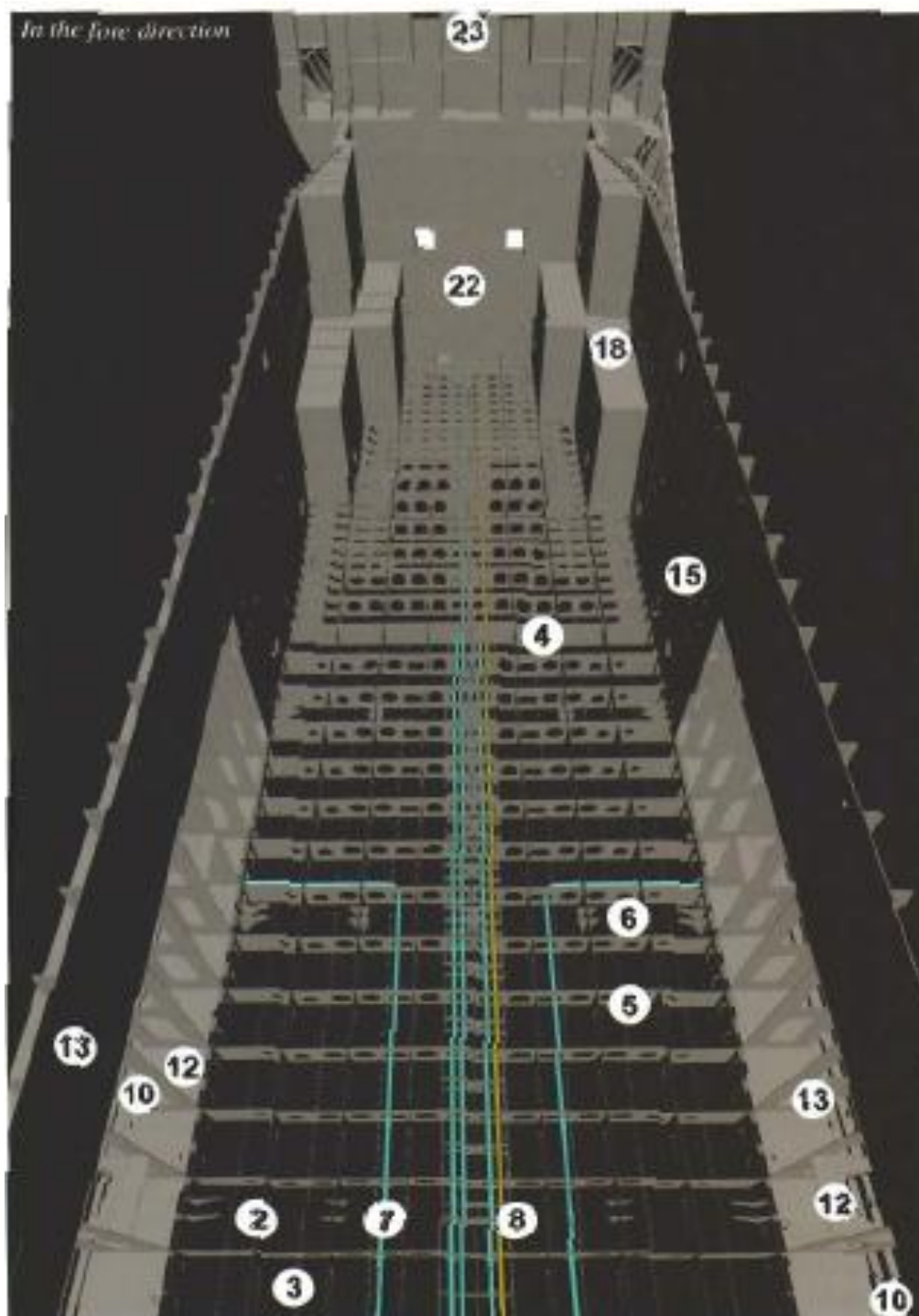


Figure 1.31: Ship Structure Components

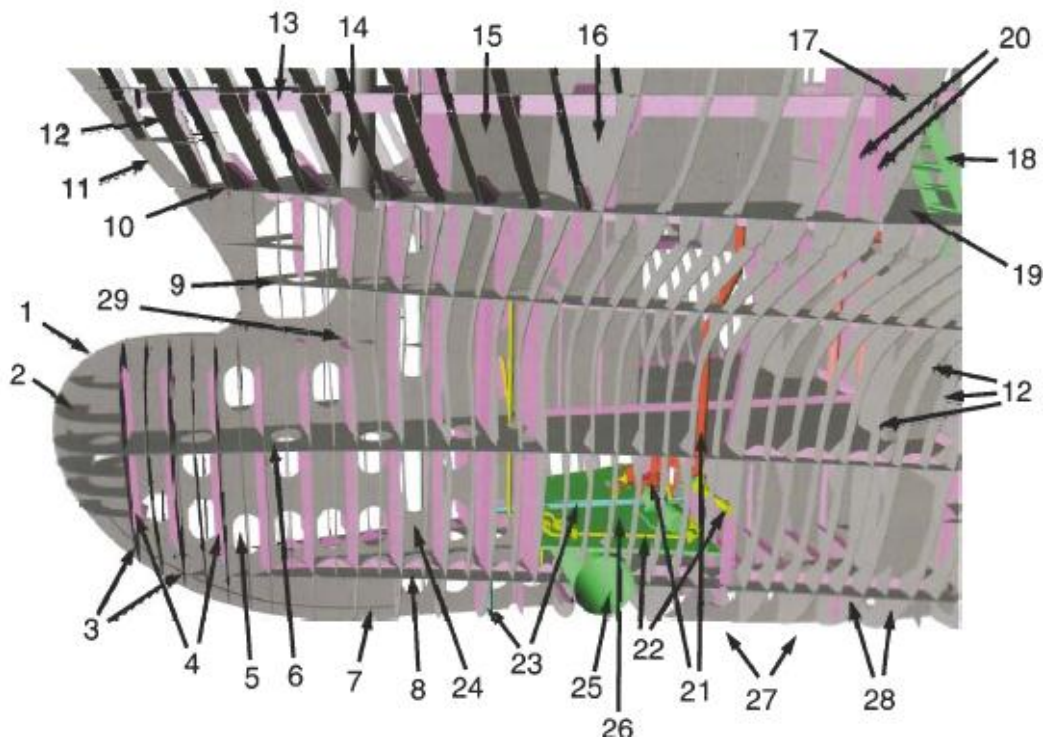


Figure 1.32: Ship Structure Components

| | |
|---|--|
| 1. Bulb | 2. Stringer bracket |
| 3. Floor | 4. Floor stiffener |
| 5. Opening | 6. Stringer deck |
| 7. Bow girder in bulb | 8. Shell stringer |
| 9. Transition of stringer deck to shell stringer | 10. Bracket with flange |
| 11. Girder bow | 12. Shell frame (HP) |
| 13. Shell stringer with flange | 14. Hawse pipe |
| 15. Chain locker | 16. Watertight bulkhead (collision bulkhead) |
| 17. Forecastle bulkhead | 18. Stairway to the forecastle deck |
| 19. Weather deck | 20. Forecastle bulkhead frames |
| 21. Emergency fire pump / bilge pump with emergency; fire line and bilge line | 22. Bilge line in bow-thruster room |
| 23. Ballast line in fore-peak | 24. Forepeak (water ballast) |
| 25. Bow-thruster tunnel | 26. Floor slab in bow-thruster room |
| 27. Deep tank (water ballast) | 28. Floors |
| 29. Wash bulkhead at the centre line of the ship | |

APPLICATION ACTIVITY

Use vocational language when necessary.

| Steps of Process | Suggestions |
|--|---|
| ➤ Translate the text below into Turkish. | <ul style="list-style-type: none">➤ Read the whole text.➤ While reading try to predict the terms that you do not know.➤ Find the english equivalents of the terms from technical dictionaries. That you can't predict.➤ You can find detailed information about the terms from the text. |

WATERLINE

The intersection of the moulded surface with a horizontal plane at a given height above the base line. The six foot water line is exactly six feet higher than the base line.

These intersections are shown in the half breadth plan in the lines drawing. They should not be confused with the "load line" marked on the outside of a ship when built.

Ship fitters use a waterline merely as a height above the base line and in this sense waterlines are marked on bulkheads, frames, and other members, for the purpose of properly setting and aligning the structure.

CHECKLIST

If you have behaviors listed below, evaluate yourself putting (X) in “**Yes**” box for your earned skills within the scope of this activity otherwise put (X) in “**No**” box.

| Evaluation Criteria | Yes | No |
|--|-----|----|
| 1. Can you recognise the ship components in the hull? | | |
| 2. Can you say the meaning of beam? | | |
| 3. Can you state the importance of bracket? | | |
| 4. Can you define the bulkhead structure? | | |
| 5. Can you name the frames? | | |
| 6. Can you compare the bracket and gusset? | | |
| 7. Can you define the keel? | | |
| 8. Can you say the functions of the manhole and access hole? | | |
| 9. Can you state the names of the ship components? | | |
| 10. Can you show the ship components on a ship diagram? | | |

EVALUATION

Please review your "No" answers in the form at the end of the evaluation. If you do not find yourself enough, repeat learning activity. If you give all your answers "Yes" to all questions, pass to the "Measuring and Evaluation".

MEASURING AND EVALUATION

Evaluate the given knowledge, If the knowledge is **TRUE**, write “**T**” , if it is **FALSE**, write “**F**” to end of the empty parenthesis.

1. () **Aft peak bulkhead** is term applied to the first main transverse watertight bulkhead forward of the stern.
2. () **Centerline** is a vertical partition corresponding to the wall of a room, extending either athwart ships or fore and aft. A steel partition in a ship.
3. () **Double bottom** is a boundary bulkhead separating cargo holds .
4. () **Cofferdams** are the spaces between two bulkheads or decks primarily designed as a safeguard against leakage of oil from one compartment to another.
5. () **Cargo hold bulkhead** is the foremost main transverse watertight bulkhead.
6. () **Sheer** is the middle line of the ship, extending from bow to stern. (from the beginning to the end).
7. () **Double bottom:** Compartments at the bottom of the ship between inner and outer bottoms, used for ballast tanks, water, fuel, oil, ect.
8. () **Keel** is the main structural member or backbone of a ship running longitudinal along center line of the bottom.
9. () **Collision bulkhead** is pipe which goes from the bow to stern in the double bottom tanks.
10. () **Pipe tunnel** is a curvature of deck in a fore and aft direction as seen in profile.

EVALUATION

Please compare the answers with the answer key. If you have wrong answers, you need to review the Learning Activity. If you give right answers to all questions, pass to the next learning activity.

LEARNING ACTIVITY-2

AIM

At the end of this activity, you will have learnt the knowledge about types of the modern ships and their parts according to international standards.

RESEARCH

- Make an observation about the ship equipments and write a report about them.
- Make a research about ship equipments on the internet and in the library.
- Make an observation about the types of ship equipments in the area where you live (seaports, harbour, marinas, shipyards, marine sport clubs)

2.1. Names of the ships equipments

- **Aft Peak Tank** The aft peak tank is the compartment in the narrow part of the stern aft of this last watertight bulkhead.
- **Ballast** Any weight or weights (usually sea water) other than cargo , that is usually placed in the inner compartments of a vessel to produce a desired draft or trim.
- **Ballast Tank** Watertight compartment to hold ballast.

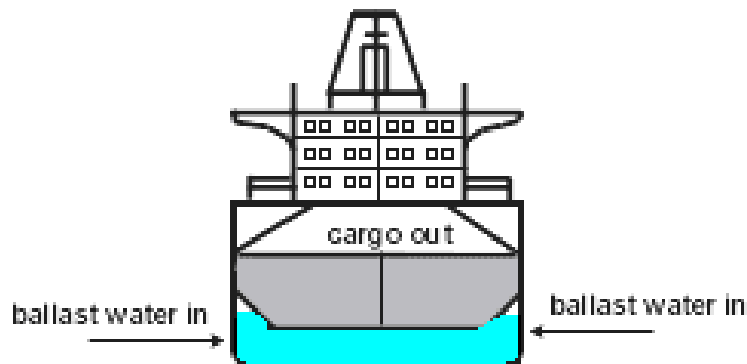


Figure 2.1: Ballast tank

- **Between Decks** The space between any two decks.



Figure 2.2: Between decks

- **Bunker** A compartment used for the filling of coal or other fuel.
- **Cargo Area** or **Cargo Length Area** all the parts and compartments in the ship including deck(s).



Figure 2.3: Cargo Area

- **Cargo Port** is a door or port in a ship's side for the loading or discharge of cargo or stores. Also called side port.



Figure 2.4: Cargo port

- **Cargo Hatch** A large opening in a deck which permits the loading of cargo into holds.



Figure 2.5: Cargo hatches

- **Carlings** are supports usually of flat plate, welded in a fore and aft direction between transverse deck beams to prevent distortion of the plating.



Figure 2.6: Carlings

- **Coaming** is a vertical, watertight, raised framework around an opening in the deck of a vessel.



Figure 2.7: Coaming

- **Companion Way** is a watertight stairway leading down from a ship's deck to spaces below.
- **Deck House** : A compartment which belongs to the captains to control and use the ship.



Figure 2.8: Deck House

- **Foundations:** Supports for boilers, engines, and auxiliary machinery.
- **Foundations, Auxiliaries :** Supports for small machinery, such as winches, condensers, heaters, etc.



Figure 2.9: Foundations

- **Funnel** A smokestack of a vessel.



Figure 2.10: Funnel

- **Gangway (Cat way)** is the raised walkway between superstructure such as between forecastle and bridge or between bridge and poop.



Figure 2.11: Gangway (Cat way)

- **Hatch** An opening in a deck for passage of cargo, etc. Companion hatches are in many shapes and sizes. Some types are discussed below. Storage compartments often need a wide entrance because the stored purls can be quite large, like engine pans, lashing gear etc. The companion hatches can be opened manually or with the aid of a crane, a hatch cradle or a hydraulic system.



Figure 2.12: Hatches

- **Hatch Battens** Flat bars which are wedged against hatch comings secure tarpaulins.
- **Hatch Beam** A portable beam used to support wooden hatch covers.
- **Hatch Coaming** is the vertical plating built around the hatchways to prevent water from entering the hold; and to serve as a framework for the hatch covers.
- **Hatch Covers** are wooden or steel covers fitted over a hatchway to prevent the ingress of water into the ship's hold and may also be the supporting structure for deck cargo.
- **Hatch Ways** are openings, generally rectangular, in a ship's deck affording access into the compartment below. Also called hatches.



Figure 2.13: Hatch Ways

- **Pontoon hatch covers**

The most common hatch covers nowadays on ships up to 10,000 tons are the pontoon hatch covers. Approximately 80-90 % of these vessels use this system. The hatches (maximum weight 25 tons) are opened and closed by a hatch cradle, or a crane on the ship or on the quay. The hatch cradle can also move the pontoon hatch covers over the ship in the longitudinal direction. This system allows the hatch covers to be stacked on the coaming. Reasons for buying pontoon hatch covers with a hatch cradle are the systems which do not require a lot of maintenance twin decks. Cradle can operate (work) on the bulkheads.



Figure 2.14: Pontoon hatch covers

- **Main Deck** Usually the deck immediately below the shelter or weather deck.
- **Poop Deck** is the first deck above the shelter deck at aft end of a ship.
- **Port Light** is another term for side light or side round window.
- **Rudder** A flat piece or structure of wood or metal attached upright to the stern post .
- **Rudder Post** After post of stern frame to which the rudder is hung. (Also called stern post.)
- **Rudder Stock** is a member which is connected to the steering engine.



Figure 2.15: Rudder Stock

- **Shaft Alley** A casing (large enough in which to walk), covering the propeller shaft and extending from engine room to after peak.



Figure 2.16: Shaft Alley

- **Side Thrusters** A propeller in a tube that is mounted through the hull. They are particularly handy for manoeuvring by providing side thrust.



Figure 2.17: Side Thrusters

- **Tween Decks** is an abbreviation of between decks, placed between the upper deck and the tank top in the cargo holds.
- **Outside doors**

Outside doors are water tight. This means that, if the door is closed, it will only leak when submerged in water. The outside doors should be able to open and close with a single bar. The difference in the outside doors shown below is the number of dosing points. This determines how watertight the doors are.



Figure 2.18: Outside doors

- **Ventilation grills (louvers)**

All the vents of the holds, the engine room and the accommodation are shielded by ventilation grills. These can be closed water-and airtight by a cover in case of bad weather or fire.



Figure 2.19: Ventilation grills (louvers)

➤ **Manhole covers**

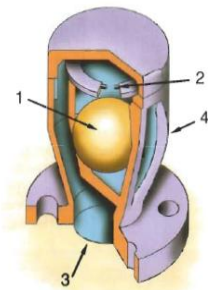
Manhole covers cover the access openings that are part of every tank, except for the cargo tanks. Manholes make it possible to inspect a tank.



Figure 2.20: Manhole covers

➤ **Tank bleeders**

Every fluid-containing tank must have a means of venting in order to prevent over-and under pressure during emptying or filling. For this purpose, every tank has a venting pipe. This pipe ends on the freeboard deck in a tank bleeder that ensures that no seawater gets into the tank. In case of submersion of the tank bleeder, the ball present inside will float upwards until it is pressed against a rubber ring. This mechanism seals the pipe from seawater.



1-plastic ball 2-rubber gasket 3-vent opening 4-air and water release pipe

Figure 2.21: Tank bleeders

➤ **Onboard loading gear**

Transshipment takes cargo into the ship at the port. Most cargo is moved with the aid of loading gear. Only very small and lightweight cargo is still moved by man-power. The loading gear is either present on the ship (self-discharger) or at the transfer yard. In the latter case the quay has a large array of mobile cranes capable of moving across the length of the quay. These cranes used to move exclusively on rails, but nowadays an increasing number of cranes are equipped with ordinary wheels with air-tyres and steering capabilities. This allows the cranes to move freely across the entire quay.



Figure 2.22: Onboard loading gear

2.2. Conventional types of crane

The advantage that the conventional revolving cranes have over the low types is that during topping and slacking, the load remains at the same height. This horizontal level luffing / load travel; is achieved by using the high position of the pulley block and the way that the runner reeves through. This ensures that it slacks the same distance as the top of the jib rises. When lowering, the same thing happens in reverse. Conventional cranes can differ in the ways that the jib is slacked and topped:

- with a cable (runner)
- with (two) hydraulic cylinders

| |
|----------------------------|
| 1-Jib |
| 2-Crane house |
| 3-Hoisting rope (runner) |
| 4-Hanger / topping lift |
| 5-Cabin |
| 6-Pulley |
| 7-Hanger pulley |
| 8-Turning point of the jib |

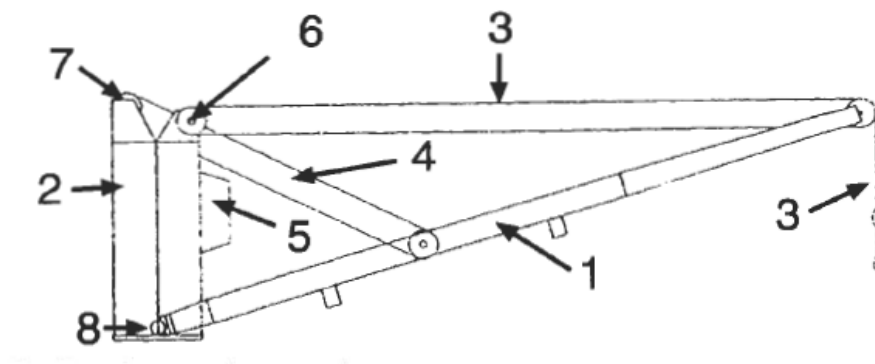


Figure 2.23: Conventional type crane

2.3. Anchor Equipments

➤ Purpose

The purpose of the anchor gear (or ground tackle) is to fix the position of a ship in shallow water by using the seabed. Reasons for doing this can be;

- The ship has to wait until the berth becomes vacant
- To load or discharge cargo when a port does not have a berth for the ship, either temporarily or permanent.
- To help with manoeuvring if the ship does not have bow thrusters and / or no tugboats are available.
- In emergency cases to avoid grounding

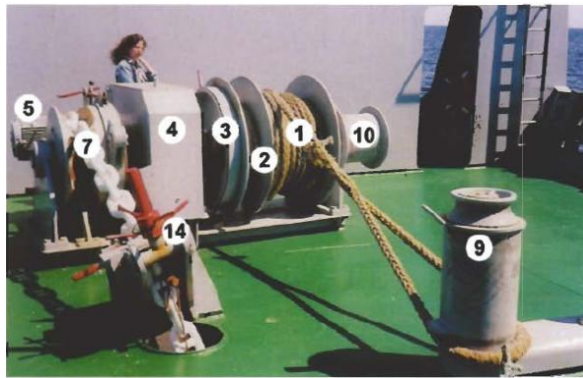


Figure 2.24: Anchor Equipment

➤ Overview of anchor equipment

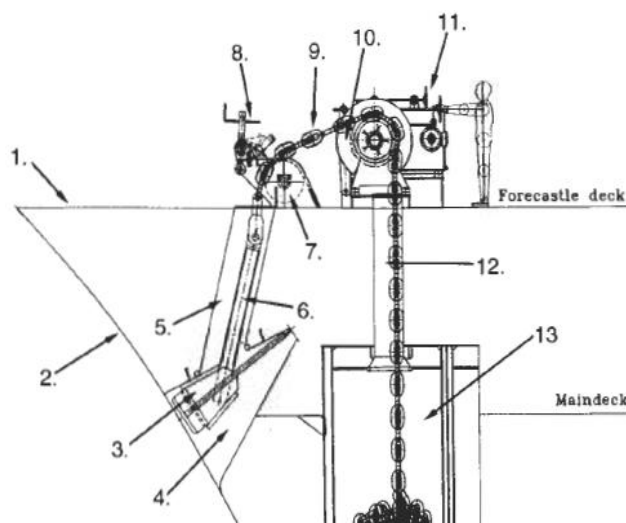


Figure 2.25: Anchor Equipment

| | |
|----|--|
| 1 | Forecastle deck |
| 2 | Stem |
| 3 | Anchor |
| 4 | Anchor pocket |
| 5 | Hawse pipe |
| 6 | Anchor shank |
| 7 | Guide roller |
| 8 | Chain stopper with securing |
| 9 | Anchor chain |
| 10 | Windlass |
| 11 | Control levers for the brake band and winch operation (up or down) |
| 12 | Spurling pipe |
| 13 | Chain locker |

➤ **Overview of anchor equipment**

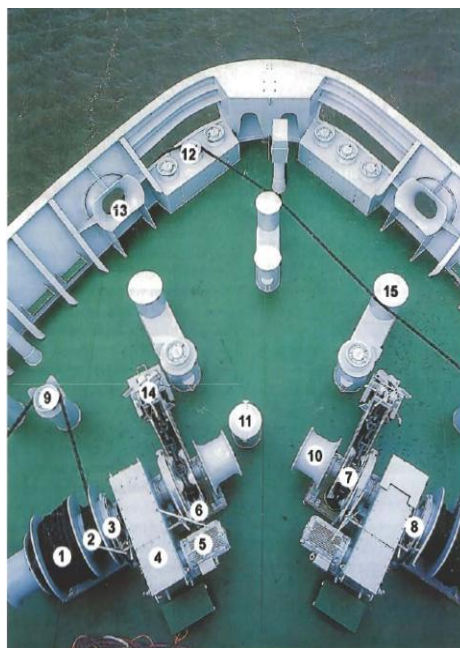


Figure 2.26: Overview of anchor equipment

| | |
|-----|---|
| 1. | Storage part of the mooring drum |
| 2. | Pulling section the drum (working part) |
| 3. | Brake band |
| 4. | Gear box |
| 5. | Electro-motor |
| 6. | Spurling pipe |
| 7. | Chain in the gypsy wheel |
| 8. | Dog clutch |
| 9. | Guide roller |
| 10. | Warping head |
| 11. | Hatch to chain locker |
| 12. | Guide roller, guide pulleys |
| 13. | Fairlead |
| 14. | Chain stopper, hawse pipe below |
| 15. | Bollard (double) |

➤ **Anchors**

Anchors are the final safety recourses of a ship. From the ancient times of the first boats, the men send a stone tied to a rope in to the sea to keep the boat in position.

The stern anchor is used to prevent ships from rotating due to the changes in a river-current. Anchors can be distinguished as:

Conventional types;
HHP-anchors (high holding power)
SHHP-anchors (super high holding power)

Common conventional anchor types are: Spek, Hall, Union, Baldt, Spek anchors have the advantage of being fully balanced. Accepted HHP anchors are AC14. Pool and Danforth. CQR and plow-type anchors are only used on small craft. Various copies of accepted types are made all over the world.

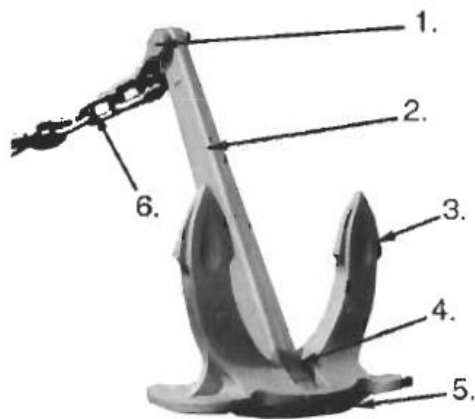


Figure 2.27: Anchor

| | |
|----|--------------------------|
| 1. | Crown/shackle |
| 2. | Shank |
| 3. | Flukes |
| 4. | Crown pin |
| 5. | Crown plate |
| 6. | Anchor chain with swivel |

➤ **Anchor chain**

The chain runs from the chain locker, through the spurling pipe, follows the gypsy wheel of the windlass through the hawse pipe, arrives the anchor. The anchor chain consists of links with studs to prevent kinks in the chain.



Figure 2.28: Anchor chain
1-half link 2-locking pin 3-stud

➤ **Hawse-Pipes and Anchor Pockets**

The hawse pipe is a tube that leads the chain to the forecastle deck. A water-spray in the pipe cleans the chain during heaving of the anchor.



Figure 2.29: Hawse-Pipes and Anchor Pockets

➤ **Chain Stopper/Cable Stopper**

The chain stopper absorbs the pull of the chain by diverting it to the hull. The chain stopper's holding force should be min. %80 of tensile breaking strength of the anchor chain. Furthermore, the hawse pipe's resistance absorbs 20% and the windlass should have a holding force of 45% of the minimum break load.

➤ **Winches**

Anchor winches or capstans are used to heave in and pay out the anchors and anchor chains in a controlled way. The same winch can be used to operate a mooring drum. A clutch is used to connect / disconnect the gypsy wheel or the mooring drum to the main shaft. The anchor can be hoven if the gypsy wheel is coupled to the main shaft.

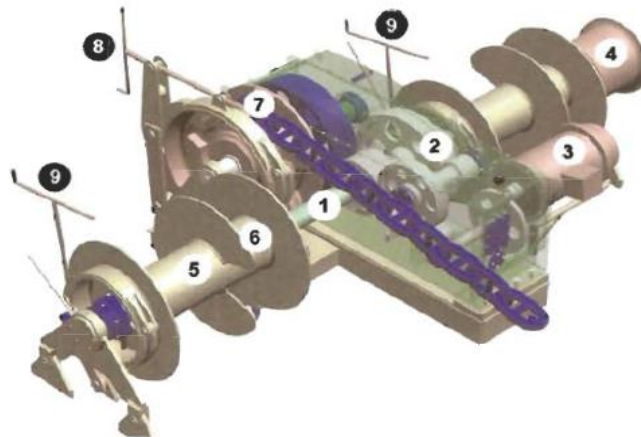


Figure 2.30: Winch

1. Main shaft
2. Gear box
3. Electric motor
4. Warping drum
5. Drum (storage part)
6. Drum (working part)
7. Gypsy wheel
8. Control lever for the band brake
9. Clutch with control lever

2.4. Mooring Gear Auxiliaries

One or more winches can be placed on the foreship, depending on the size of the ship and the preference of the owner. As shown in the picture, the warping drum, bollard and fairlead are preferably positioned in a straight line

➤ **Hawses, Lead ways, Guide Pulleys and Bollards**

A rope is guided from the shore via a panama chock, through the bulwark to a bollard or winch. The panama chock must be able to withstand large forces, because the direction of the rope changes inside the panama chock. The panama chock must be curved to prevent wear of the rope.

Roller fairleads can be made of vertical and horizontal rollers. Their function is the same as the panama chock. However, the roller fairleads cause less wear to the ropes.



Figure 2.31: Hawses, Lead ways, Guide Pulleys and Bollards

1. Warping head
2. Drum
3. Bollards
4. Eyes to connect the stoppers
5. Guide roller (fairlead)
6. Centre lead
7. Lead way
8. Head line
9. Forward spring



Figure 2.32: Bollard

Bollard

1. Guide roller
2. Nose
3. Stopper eye

APPLICATION ACTIVITY

Use vocational language when necessary.

| Steps of Process | Suggestions |
|--|--|
| ➤ Translate the text below into Turkish. | <ul style="list-style-type: none"> ➤ Read the whole text. ➤ While reading try to predict the terms that you do not know. ➤ Find the english equivalents of the terms from technical dictionaries. That you can't predict. ➤ You can find detailed information about the terms from the text. |

Depth: The height of the ship at the midship section from the base line to the moulded line of the deck at side (underneath).

Draft (Moulded) : The height from the base line to the load water line.

Freeboard (Moulded) : The difference between the moulded depth and the moulded draft. (It is the height of the side of the vessel which is above the water when she floats at her load water line).

Camber : The curvature of the deck transversely. It is measured by the difference in height between the deck at center and the deck at side.

Tumble home: The amount the top of the side shell slopes back toward the centerline between the point of widest breadth and the deck at side.

CHECKLIST

If you have behaviors listed below, evaluate yourself putting (X) in “**Yes**” box for your earned skills within the scope of this activity otherwise put (X) in “**No**” box.

| Evaluation Criteria | Yes | No |
|--|------------|-----------|
| 1. Can you define ballast and ballast tank? | | |
| 2. Can you state the hatch and its types? | | |
| 3. Can you recognise the side thrusters? | | |
| 4. Can you define the ventilation grills? | | |
| 5. Can you define the tank bleeders and its parts? | | |
| 6. Can you define the cranes and its types? | | |
| 7. Can you say the anchor equipment? | | |
| 8. Can you define the anchor? | | |
| 9. Can you define a anchor chain? | | |
| 10.Can you say sections of a winch? | | |

EVALUATION

Please review your "No" answers in the form at the end of the evaluation. If you do not find yourself enough, repeat learning activity. If you give all your answers "Yes" to all questions, pass to the "Measuring and Evaluation".

MEASURING AND EVALUATION

TRUE-FALSE

Evaluate the given knowledge, If the knowledge is **TRUE**, write “**T**” , if it is **FALSE**, write “**F**” to end of the empty parenthesis.

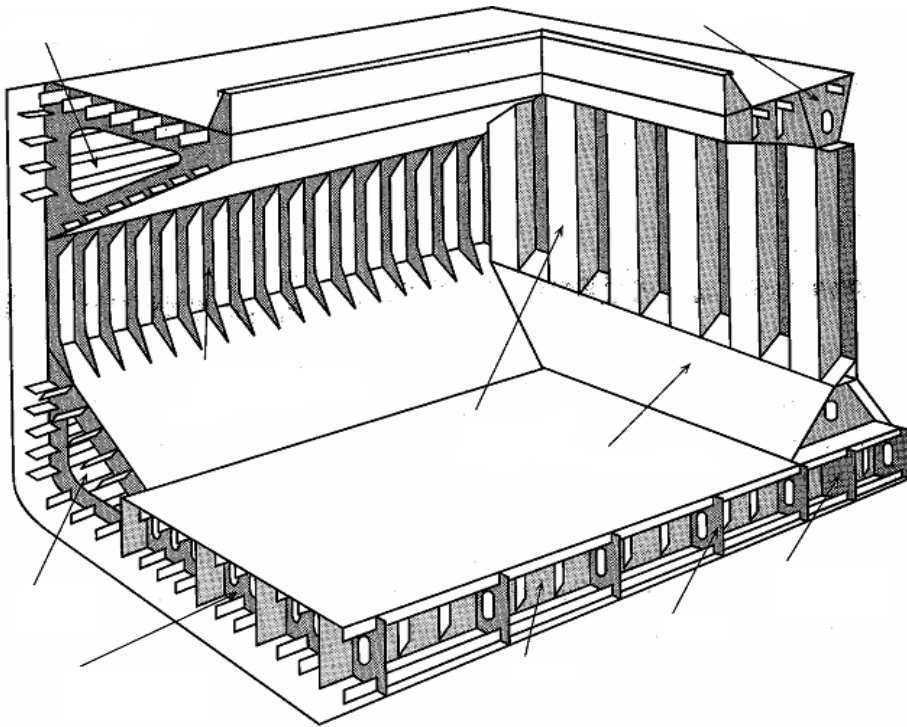
1. () **Ballast tank** is a watertight compartment to hold ballast.
2. () **Between decks** is the space between any two decks.
3. () **Funnel** is kind of tank to keep the smoke.
4. () **Rudder** is a flat piece or structure of wood or metal attached upright to the stern post.
5. () **Rudder post** is another term for side light or side round window.
6. () **Shaft alley** is a casing, covering the propeller shaft and extending from engine room to after peak.

EVALUATION

Please review your "No" answers in the form at the end of the evaluation. If you do not find yourself enough, repeat learning activity. If you give all your answers "Yes" to all questions, pass to the "Measuring and Evaluation".

MODULE EVALUATION

Assess yourself after you have studied the Module, “Technical English: Ship Knowledge” according to the knowledge and skills you have gained throughout the module. You can start the next module due to this assessment result.



1-Write the names of the parts of the ship which are shown by arrows.

EVALUATION

Please compare the answers with the answer key. If you have wrong answers, you need to review the Learning Activity. If you give right answers to all questions, pass to the next learning activity

ANSWER KEYS

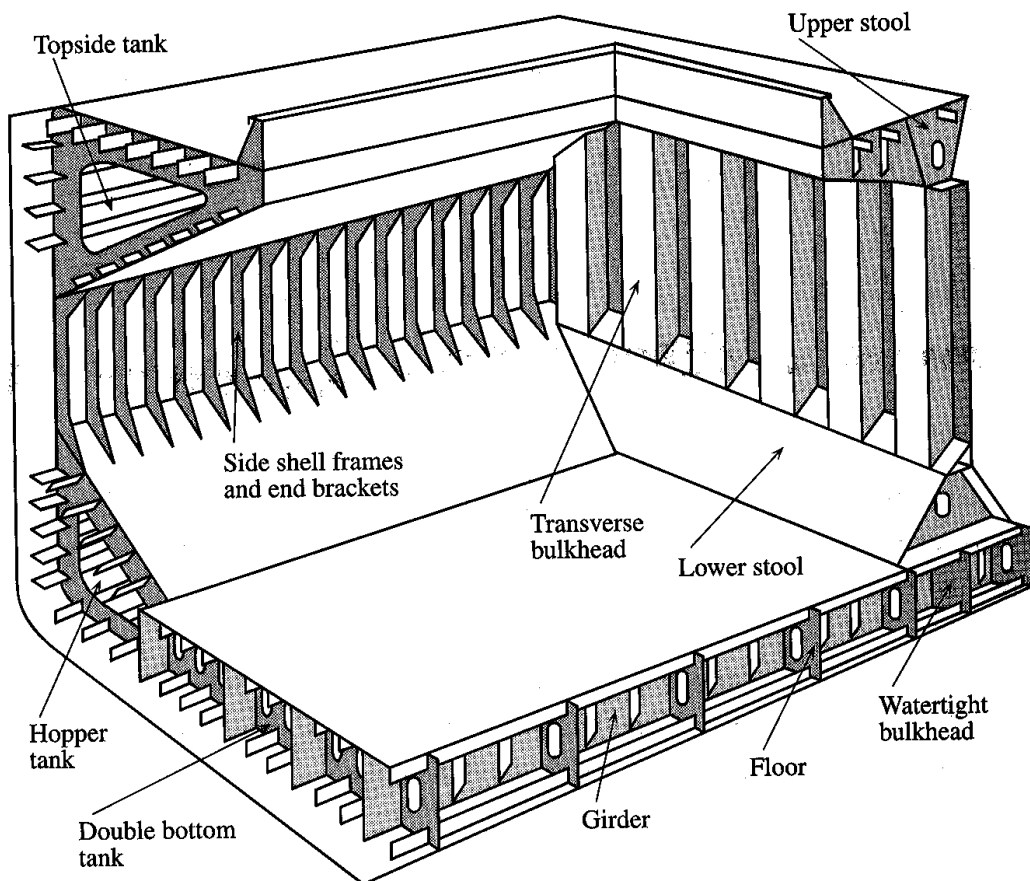
LEARNING ACTIVITY-1: ANSWER KEYS

| | |
|-----------|--------------|
| 1 | True |
| 2 | False |
| 3 | False |
| 4 | True |
| 5 | False |
| 6 | False |
| 7 | True |
| 8 | True |
| 9 | False |
| 10 | False |

LEARNING ACTIVITY-2: ANSWER KEYS

| | |
|----------|--------------|
| 1 | True |
| 2 | True |
| 3 | False |
| 4 | True |
| 5 | False |
| 6 | True |

MODULE EVALUATION: ANSWER KEYS



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