

2014

***MEO CLASS 4
SAFETY (COSCPPOOL)
ORAL PREPARATION
FILE PART 4***

SOLAS AND MARPOL QUESTION AND ANSWER

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03-Mar-14



SOLAS, MARPOL, STCW

Q 66: Name and How many CODE and CONVENTION we have?

A 66:

CODE	CONVENTION
ISM	SOLAS
IMDG	MARPOL
FSS & LSA	STCW
IMSBC	LOAD LINE
IBC	TONNAGE
ISPS	BALLAST WATER MANAGEMENT
NO _x TECHNICAL	ANTIFOULING

CODE:

- **ISM : INTERNATIONAL MANAGEMENT FOR THE SAFE OPERATION OF SHIP AND POLLUTION PREVENTION**
- **IMDG: INTERNATIONAL MARITIME DANGEROUS GOOD CODE.**
- **FSS: INTERNATIONAL CODE FOR FIRE SAFETY SYSTEM**
- **LSA: INTERNATIONAL CODE FOR LIFE SAVING APPLIANCES.**
- **IMSBC: INTERNATIONAL MARITIME SOLID BULK CARGO CODE.**
- **IBC: INTERNATIONAL BULK CHEMICAL CODE.**
- **ISPS: INTERNATIONAL SHIP AND PORT FACILITIES SECURITY CODE.**

CONVENTION:

- **SOLAS: INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA.**
 - **MARPOL: INTERNATIONAL CONVENTION FOR MARINE POLLUTION.**
 - **STCW: INTERNATIONAL CONVENTION ON STANDARD OF TRAINING CERTIFICATE AND WATCHKEEPING FOR SEA FARER.**
 - **LOAD LINE: INTERNATIONAL LOAD LINE CONVENTION**
 - **TONNAGE: INTERNATIONAL TONNAGE CONVENTION.**
 - **BWM: INTERNATIONAL CONVENTION ON BALLAST WATER MANAGEMENT.**
- =====

Q 67: Name the STCW chapter ?

A 67:

S.T.C.W.

**INTERNATIONAL CONVENTION ON STANDARD OF TRAINING
CERTIFICATION AND WATCH KEEPING FOR SEA FARERS**

- Chapter 1 General provisions
 - Chapter 2 Master and Deck department
 - Chapter 3 Engine department
 - Chapter 4 Radio communication and Radio personnel
 - Chapter 5 Special training required for personnel on certain type of ship
 - Chapter 6 Emergency occupational safety, Medical care and Survival function
 - Chapter 7 Alternative certificate
 - Chapter 8 Watch keeping
- =====

Q 68: Name of All SOLAS chapter only? *Mostly surveyor asking only name in your first attempt?*

A 68:

There are 12 chapters of SOLAS.

- Chapter 1 General provisions
 - Chapter 2-1 Construction – Structure, subdivision and stability, machinery and electrical installations
 - Chapter 2-2 Construction – Fire protection, fire detection and fire extinction.
 - Chapter 3 Life-saving appliances and arrangements.
 - Chapter 4 Radio communications.
 - Chapter 5 Safety of navigation.
 - Chapter 6 Carriage of cargoes.
 - Chapter 7 Carriage of dangerous goods.
 - Chapter 8 Nuclear ships.
 - Chapter 9 Management for the safe operation of ships.
 - Chapter 10 Safety measures for high-speed craft.
 - Chapter 11-1 Special measures to enhance maritime safety.
 - Chapter 11-2 Special measures to enhance maritime security.
 - Chapter 12 Additional safety measures for bulk carriers.
- =====

Q 69: Explain Each and Every chapter of SOLAS in detail?

A 69:

Friend most important is surveyor asking every time few chapter and them favorite chapter are *Chapter no. 3,7,9,11 and 12 only and those who sailed on Bulk 99% chance that he can ask you chapter 12 in full detail. Rest all chapters I never heard that surveyor asked but in case if you have bad luck than possible he can ask you.in most of the case I already explain SOLAS regulation in above each and every topic.*

So you have to read all of the Regulation and mugged up.so I cant say what to read and what to answer.so my simple advice to you Read above chapter which I mentioned and try to make out some notes by your self. That what I can say.

Frankly speaking,

See in chapter 3 all about L.S.A codes and all regulation I already discussed above.

In chapter 7 about IMDG code which I will explain you later.

In chapter 9 about ISM,SMS which are the most important topic, I will explain you.

In chapter 11 about ISPS,LRIT,AIS,etc etc....i will explain you.

In chapter 12 about Bulk carrier regulation you have to read full. I cant say what he can ask you.

Here I will write some basic definition which can be ask by surveyor.

- **Regulations** :means the regulations contained in the annex to the present Convention.
- **Administration** :means the Government of the State whose flag the ship is entitled to fly.
- **A tanker** is a cargo ship constructed or adapted for the carriage in bulk of liquid cargoes of an inflammable* nature.
- **New ship** means a ship the keel of which is laid or which is at a similar stage of construction on or after 25 May 1980.
- **Existing ship** means a ship which is not a new ship.
- **A mile** is 1,852 m or 6,080 ft.
- **Anniversary date** means the day and the month of each year which will correspond to the date of expiry of the relevant certificate.
- **Dead ship condition** is the condition under which the main propulsion plant, boilers and auxiliaries are not in operation due to the absence of power.
- **Emergency switchboard** is a switchboard which in the event of failure of the main electrical power supply system is directly supplied by the emergency source of electrical power or the transitional source of emergency power and is intended to distribute electrical energy to the emergency services.

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Q 70: Explain SOLAS CHAPTER 9 in detail ? Explain ISM CODE? Main question Objective of ISM ?

Q 70 a: Explain SMC & DOC ?

Q 70 b: Explain SMS ?

Q 70 c: Explain how you will follow ISM ?

Q 70 d: Explain Duties of DPA and MASTER ?

Q 70 e: What is Conformity and Major Conformity ? Which are they ?

Q 70 f: What all checks are done by PSC ?

Q 70 g: How you will come to know that your ship is following ISM in daily base routine ?

A 70, 70 a, 70 b, 70 c, 70 d, 70 e, 70 f, 70 g :

SOLAS CHAPTER 9

Management for the safe operation of ship

APPLY TO:

- Passenger ships including passenger high-speed craft, not later than 1 July 1998
- Oil tankers, chemical tankers, gas carriers, bulk carriers and cargo high-speed craft of 500 gross tonnage and upwards, not later than 1 July 1998
- Other cargo ships and mobile offshore drilling units of 500 gross tonnage and upwards, not later than 1 July 2002.

NOT APPLY TO:

- This chapter does not apply to government-operated ships used for non-commercial purposes.

TOTAL NO OF REGULATION OF SOLAS CHAPTER 9: 6

- Regulation 1 Definitions
- Regulation 2 Application
- Regulation 3 Safety management requirements
- Regulation 4 Certification
- Regulation 5 Maintenance of conditions
- Regulation 6 Verification and control.

NOTE:

Now you can explain ISM certificate, SMS. Generally he will ask you to explain Chapter 9 but after you said above try to explain ISM CODE.

ISM CODE

Purpose Of ISM code & international requirements:

- To provide an international standard for the safe management and operation of ships and for prevention of pollution.

OBJECTIVE:

- Ensure safety at sea,
- Prevention of human injury or loss of life,
- Avoidance of damage to the environment & to the property.

APPLY TO:

- Oil Tankers, Cargo high-speed craft, Chemical Tankers, Gas Carriers and Bulk Carriers to comply by 1 July 1998. **Other Cargo ships and mobile Offshore drilling rigs of over 500 GRT to comply by 1 July 2002.**
- The new chapter IX to SOLAS 1974, Management for the Safe Operation of Ships requires compliance of Passenger Vessels and high speed Passenger Craft over 500 GRT by 1 July 1998..

ISM Certification:

The application of the code will lead to the issue of two certificates:

- The Document Of Compliance (DOC).
- The Safety Management Certificate (SMC).
- Interim SMC and DOC.

Issuing authority of DOC & SMC:

Flag state administration or authorized classification societies on their behalf.

The Document Of Compliance (DOC).

- Will be issued to the company following a successful audit of the shore side aspects of the Safety Management System .
- Evidence required that the system as been in operation on at least one type of ship in the companies fleet for a period of three months.
- Specific to ship types at time of audit .
- Valid for 5 years
- Subject to annual verification (within 3 months of anniversary date)

The Safety Management Certificate (SMC)

- If a Major NON Conformity is found in the audit, the SMC and DOC are withdrawn.
- The original SMC is kept on the ship and copy is kept with the company.
- issued to each ship following audit .
- evidence that SMS has been in operation for 3 months prior to audit .
- valid DOC required .
- valid for 5 years
- The intermediate audit is carried out between the second and the third anniversary date of the ship.

Types of DOCs

Interim DOC

- An interim DOC is issued to a newly established company or when a new type of ship is added in the company.
- The company is requested to submit SMS implementation plan and 12 months are given to the company for fulfilling the ISM requirements.
- The company shall undergo initial audit, and in case of newly built shipping company within the validity period of interim DOC i.e. 12 months.
- The company shall undergo additional audit in case new ship type is added to the shipping company within the validity period of interim DOC i.e. 12 months.
- For a new company, further document review is conducted prior to the audit by administration.

Short Term DOC

- A short term DOC is issued on the day of the audit by the administration auditor as a response or proof of completion of the initial, annual or renewal audit process.
- Validity of short term DOC is 5 months.

Types of SMC

Interim SMC

- Issued to the company which posses Main DOC, Interim DOC or Short term DOC.
- Issued to the newly built ship added to the existing fleet of the shipping company.
- Issued to a new ship with change in Management Company.
- Issued to a company with change in the flag state.
- Its Validity is for 6 months.
- A ship undergoes initial audit with interim SMC and it must fulfil the entire requirements to comply the SMS based on ISM code to get the main SMC.

Short Term SMC

- A short term SMC is issued on the day of the audit by the administration auditor as a response or proof of completion of the initial, annual or renewal audit process.
- Validity of short term SMC is 5 months.

Safety Management System (SMS)

Objectives of the company:

- Provide for safe working practices and a safe working environment
- Establish safeguards against possible risks
- Continuously improve safety management skills of personnel ashore and aboard ships,

The functional requirements for a safety management system

- A safety and environmental policy
- Instructions and procedures to ensure that safe operation of the vessel in compliance with relevant international and flag state legislation
- Defined levels of authority and communication between shore and ship personnel
- Procedures for reporting accidents and non-conformities with the code
- Procedures for responding to emergency situations (drills etc)
- Procedures for internal audits and management reviews
- A system is in place for the on board generation of plans and instructions for key shipboard operations.

These tasks may be divided into two categories:

a) Special operations-those where errors only become apparent after a hazardous situation or accident has occurred. E.g. ensuring watertight integrity, navigational safety (chart corrections, passage planning), maintenance operations, bunker operations

b) Critical shipboard operations- where an error will immediately cause an accident or a situation that could threaten personnel, environment or vessel. e.g. navigation in confined waters, operation in heavy weather, bunker or oil transfers, cargo operations on tankers.

- *A Safety Management system (SMS) meeting the requirements of the ISM code requires a company to document its management procedures and record its actions to ensure that conditions, activities*

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and tasks that affect safety and the environment are properly planned, organized, executed and checked.

- *A SMS is developed and implemented by people and clearly defines responsibilities, authorities and lines of communication.*
- *A SMS allows a company to measure its performance against set criteria hence identifying areas that can be improved.*
- *The increase in Safety Management skills improves morale and can lead to a reduction in costs due to an increase in efficiency and a reduction in claims*
- *The ISM guideline is in the Chapter IX of SOLAS. It is mandatory for all vessels after 1st July 2002. There are two parts in ISM*

i) Part-A: Implementation.

ii) Part-B: Certification and Verification

Part-A: *(Remember he can ask you a particular name, he asked me tell me which is no 6, 10?)*

1. General, objective, application, functional requirements
2. Safety & environment protection policy.
3. Company responsibility & authority.
4. DPA.
5. Master responsibility and Authority.
6. Resource & personnel.
7. Development of plan for shipboard operation.
8. Emergency preparedness.
9. Report & analysis on non-conformities, accidents & hazardous occurrence
10. Maintenance of ship equipments
11. Documentation.
12. Company verification, review and Evolution.

Part-B:

13. Certification and periodical verification
14. Interim certification.
15. Verification.
16. Form of certification.

Safety and environmental protection policy

- The company should establish a safety and environmental protection policy which describes how objectives listed above will be achieved.
- The company should ensure that the policy is implemented and maintained at all levels of the organisation both ship based as well as shore based.

Company responsibilities and authority

- There must be disclosure from the owner to the administration as to who is responsible for the operation of the ship.
- The company should define and document responsibility, authority and interrelation of all personnel who manage, perform and verify work relating to and affecting safety and pollution prevention.
- The company must ensure there are adequate resources and shore based support for the designated person or persons to carry out their function.

DPA means Designated Person Ashore.

- A person who provides a link between the company & the ship. He has a direct access to the highest level of management.
- Monitoring the safety & pollution prevention aspect of ship & to ensure adequate resources & shore base support for ship.
- A person or persons who has direct access to the highest levels of management providing a link between the company and those on board.
- The responsibility and authority of the designated person is to provide for the safe operation of the vessels. He should monitor the safety and pollution prevention aspects of the operation of each vessel and ensure there are adequate shore side resources and support

Master responsibilities

- Implement of safety & environment protection policy.
- Motivation of crew in observing the policy.
- Issue order & instruction.
- Review SMS & report.

Resources and Personnel:

- The company should ensure that the Master is suitably qualified and fully conversant with the SMS.
- They should also ensure that the ship is correctly manned.
- The company should ensure that there is adequate familiarization with safety and protection of the environment for new personnel.

- They should ensure that the personnel have an adequate understanding of the relevant rules, regulations, guidelines and codes.
- Training is to be provided where necessary. Relevant information for the SMS should be promulgated and be written in an easy to understand method.

Development of plans for shipboard operations: -

- The company should establish procedures for the generation of shipboard plans and instructions with regard to the prevention of pollution and that these should be generated by qualified personnel

Emergency Preparedness:

- The company should establish procedures for the response actions to potential emergency situations.
- Programmes for drill should be established and measures taken to ensure that the company's organization can respond to hazards and accidents.

Reports and analysis of non-conformities, accidents and hazardous occurrences

- The company should ensure there is a procedure for the reporting and analysis of accidents, hazardous occurrences and non-conformities, and for the corrective action.

Maintenance of the ship and equipment

- The company is to ensure that the vessel is properly maintained. Procedures within the SMS should be in place to identify, record and plan for repair defects.
- A system of preventive maintenance should be in operation.
- Regular inspections integrated with the ships operational maintenance routine should take place to ensure that the vessel is in compliance with relevant regulations.

Documentation

- The company should establish and maintain procedures for the control of all documentation relevant to the SMS. This should include;
 1. Valid documents are available at all relevant locations
 2. Changes to documents are reviewed and approved to authorized personnel
 3. Obsolete documents are promptly removed

All documents, carried in a company approved relevant form, should be present on board

Company verification, review and evaluation

- The company should carry out periodic audits to verify that safety and pollution prevention's are complying with SMS.
- The audits and corrective actions should be carried out as per laid down procedures.
- Personnel carrying out the audits should be independent of the areas that they are carrying out the audit unless size of the company is such that this is impractical.
- Deficiencies or defects found should be brought to the attention of the personnel in that section and the management team so effective corrective action can be carried out

Certification, verification and control

The following documentation is issued by whichever administration, complying with ISM, is relevant to the shipping company:

- A DOC is issued to all companies who can demonstrate that they have complied with the code should be held.
- **A copy of the DOC should be held on board to allow the Master to produce it to the relevant authorities is required.**
- An SMC is issue to the ship following verification that the ship and company comply with the requirements of SMS.

The types of documentation the auditor will wish to see to verify compliance with the ISM are as follows:

- Log books
- Safety and management meeting minutes and follow up actions
- Medical log
- Company circular letters
- Planned maintenance records
- Records of verification
- Records of masters review of the system
- Records of internal audits and follow up
- Records of chart corrections
- Class quarterly listings
- Records of passage planning
- Oil record books
- Garbage logs
- Company manual and forms

WHAT IS CONFORMITY?

- An observed situation where objective evidence indicates the non-fulfillment of a specified requirement of the ISM Code or the Company's SMS. This deviation or the identified lack of a plan or instruction for a key shipboard operation. Could endanger the safety of people, the ship its cargo and the environment.

WHAT IS MAJOR NON-CONFORMITY? (*most important question by surveyor*)

- Major non-conformity means an identifiable deviation, which poses a serious threat to crewmembers or to the ship or is a serious risk to the environment and requires immediate action.
- In addition, the lack of effective and systematic implementation of an ISM requirement is considered as major non-conformity.

The ship should correct all the following major non-conformities prior to departure:

- The ISM certificates are not on board.
- The Company mentioned on the DOC is not the same as the Company mentioned on the SMC.
- The Safety Management documentation is not on board.
- Safety information is not in the working language or in the language understood by the crew.
- Senior officers are unable to identify the operator and designated person.
- There is no procedure to contact the Company in emergency situations.
- Drills have not been carried out according to the program.
- New crew-members are not familiar with their duties (within the SMS).
- Master's overriding authority is not documented and Master is unaware of his authority.
- No records of maintenance kept or no evidence of maintenance has
- No records of maintenance kept or no evidence of maintenance has been carried out as indicated in the records.

WHAT ALL CHECKS DOES PSC INSPECTOR ON SHIP MAKE?

- Is the ISM Code applicable to the ship?
- Is ISM certification on board?
- Are certificates and particulars in order?
- Is there a Company safety and environmental protection policy and are the appropriate crew members familiar with it?
- Is the Safety Management documentation readily available on board?
- Is the relevant documentation on the SMS in a working language or a language understood by the ship's crew?
- Can senior officers identify the Company responsible for the operation of the ship and does this correspond with the entity specified on the ISM certificates?

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- Can senior officers identify the “designated person“?
- Are procedures in place for establishing and maintaining contact with shore management in case of emergency?
- Are programs for drills and exercises to prepare for emergency actions available on board?
- How have new crew members been made familiar with their duties and are there instructions available which are essential prior to sailing ?
- Can the Master provide documented proof of his responsibility and authority, which should include his overriding authority?
- Does the ship has a routine maintenance and is there records available?
- Have non-conformities, accidents, incidents and hazardous situations been reported to the Company and has timely corrective actions been taken by the Company?
- Are there procedures in place to maintain the relevant documentation?
- Are there procedures in place intended to internal audits and have internal audits been carried out? (PSC Officer, normally, does not examine the contents of non-conformities resulting from internal audits).
- If detainable deficiencies and/or many deficiencies are detected, the PSC officer will use his professional judgment to decide if this means a failure of the Safety Management System.

ISM following in daily base routine ?

- In daily base we worke a lot and we must have to follow the procedure for that particular work.
 - For example
To start Fresh water generator we must have to follow procedure and this procedure must be written and pasted near by the FWG.
 - Need to check that ISM certificate are valid.
 - DOC must be Valid.
 - SMS must be followed.
 - SMP must be updated.
 - Every crew must know the safety procedure.
 - Drill should be done on regular base.
-

Q 71: Explain SOLAS chapter 11.1 and 11.2 ?

Q 71 a: Explain ISPS code?

Q 71 b: Explain Objective of ISPS and All how many level for security and in your ship which was adopted?

Q 71 c: Function of SSO, CSO?

A 71, 71 a, 71 b, 71 c:

SOLAS CHAPTER 11.1

Special measures to enhance maritime safety

Total no of Regulation: 6

- Regulation 1 Authorization of recognized organizations
- Regulation 2 Enhanced surveys
- Regulation 3 Ship identification number
- Regulation 3-1 Company and registered owner identification number
- Regulation 4 Port State control on operational requirements
- Regulation 5 Continuous Synopsis Record
- Regulation 6 Additional requirements for the investigation of marine casualties and incidents

Ship identification number:

- This regulation applies to all passenger ships of 100 gross tonnage and upwards and to all cargo ships of 300 gross tonnage and upwards.
- Every ship shall be provided with an identification number which conforms to the IMO ship identification number scheme adopted by the Organization.
- The ship's identification number shall be permanently marked:
 - in a visible place either on the stern of the ship or on either side of the hull, amidships port and starboard, above the deepest assigned load line or either side of the superstructure, port and starboard or on the front of the superstructure or, in the case of passenger ships, on a horizontal surface visible from the air.
 - The permanent marking shall be plainly visible, clear of any other markings on the hull and shall be painted in a contrasting colour.
 - The permanent marking in outside area shall be not less than 200 mm in height.
 - The permanent marking in inside area shall not be less than 100 mm in height.
 - The width of the marks shall be proportionate to the height.

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- The permanent marking may be made by raised lettering or by cutting it in or by centre punching it or by any other equivalent method of marking the ship identification number which ensures that the marking is not easily expunged.
- On ships constructed of material other than steel or metal, the Administration shall approve the method of marking the ship identification number.

Continuous Synopsis Record

- Every ship shall be issued with a Continuous Synopsis Record.
- The Continuous Synopsis Record is intended to provide an on-board record of the history of the ship with respect to the information recorded therein.
- The Continuous Synopsis Record shall be issued by the Administration to each ship that is entitled to fly its flag and it shall contain at least, the following information
- The Continuous Synopsis Record shall contain the information:
 - the name of the State whose flag the ship is entitled to fly;
 - the date on which the ship was registered with that State;
 - the ship's identification number
 - the name of the ship;
 - the port at which the ship is registered;
 - the name of the registered owner(s) and their registered address(es);
 - the registered owner identification number;
 - the name of the registered bareboat charterer(s) and their registered address(es), if applicable;
 - the name of the Company, as defined in regulation IX/1, its registered address and the address(es) from where it carries out the safety management activities;
 - the Company identification number;
 - the name of all classification society(ies) with which the ship is classed;
 - the name of the Administration or of the Contracting Government or of the recognized organization which has issued the Document of Compliance
 - the name of the Administration or of the Contracting Government or of the recognized organization that has issued the Safety Management Certificate
 - the date on which the ship ceased to be registered with that State
- The Continuous Synopsis Record shall be in English, French or Spanish language
- Whenever a ship is transferred to the flag of another State or the ship is sold to another owner (or is taken over by another bareboat charterer) or another Company assumes the responsibility for the operation of the ship, the Continuous Synopsis Record shall be left on board.
- When a ship is transferred to the flag of another State the Government of which is a Contracting Government, the Contracting Government of the State whose flag the ship was flying hitherto shall

transmit to the Administration as soon as possible after the transfer takes place a copy of the relevant Continuous Synopsis Record covering the period during which the ship was under their jurisdiction together with any k Continuous Synopsis Records previous issued to the ship by other States.

SOLAS Chapter 11.2

Special measures to enhance maritime security

Total no of Regulation: 13

- Regulation 1 Definitions
- Regulation 2 Application
- Regulation 3 Obligations of Contracting Governments with respect to security
- Regulation 4 Requirements for Companies and ships
- Regulation 5 Specific responsibility of Companies
- Regulation 6 Ship security alert system
- Regulation 7 Threats to ships
- Regulation 8 Master's discretion for ship safety and security
- Regulation 9 Control and compliance measures
- Regulation 10 Requirements for port facilities
- Regulation 11 Alternative security agreements
- Regulation 12 Equivalent security arrangements
- Regulation 13 Communication of information

APPLY TO:

This chapter applies to:

- Passenger ships, including high-speed passenger craft;
- Cargo ships, including high-speed craft, of 500 gross tonnage and upwards; and
- Mobile offshore drilling units; and
- Port facilities serving such ships engaged on international voyages.

NOT APPLY TO:

- This chapter does not apply to warships, naval auxiliaries or other ships owned or operated by a Contracting Government and used only on Government non-commercial service.

SHIP SECURITY ALERT SYSTEM (SSAS)

All ships shall be provided with a ship security alert system

- Ships constructed on or after 1 July 2004
- Passenger ships, including high-speed passenger craft, constructed before 1 July 2004, not later than the first survey of the radio installation after 1 July 2004
- Oil tankers, chemical tankers, gas carriers, bulk carriers and cargo high speed craft, of 500 gross tonnage and upwards constructed before 1 July 2004, not later than the first survey of the radio installation after 1 July 2004;
- Other cargo ships of 500 gross tonnage and upward and mobile offshore drilling units constructed before 1 July 2004, not later than the first survey of the radio installation after 1 July 2006.

The ship security alert system, when activated, shall:

- Initiate and transmit a ship-to-shore security alert to a competent authority designated by the Administration, which in these circumstances may include the Company, identifying the ship, its location and indicating that the security of the ship is under threat or it has been compromised;
- Not send the ship security alert to any other ships;
- Not raise any alarm on-board the ship; and
- Continue the ship security alert until deactivated and/or reset.

The ship security alert system shall:

- Be capable of being activated from the navigation bridge and in at least one other location; and
- Conform to performance standards not inferior to those adopted by the Organization.

Ship Security Alert System (SSAS)

- The Ship Security Alert System (SSAS) is one safety measure for strengthening ship security and subduing acts of piracy and/or terrorism against shipping.
- Widely Acknowledged as a part of the International Ship and Port Facility Security Code (ISPS code), the Ship Security Alert System (SSAS) complements the International Maritime Organization (IMO)'s attempts to increase maritime vessel security
- Cospas-Sarsat, with International Maritime Organization's cooperation, came up with this project of Ship Security Alert System (SSAS).



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- The basic idea is that in case of an attempted piracy effort or terrorists act, the ship's SSAS beacon would be activated, responding to which an appropriate law-enforcement or military forces would be dispatched for rescue.
- The Ship Security Alert System (SSAS) beacon and the Aircraft Transponder Emergency Code 7700 are operated on the fundament of similar principles.



How SSAS works:

- When the maritime security staffs comprehend probable danger from pirates or terrorists a Ship Security Alert System (SSAS) alert is triggered.
- The beacon transmits a specific country code, reacting to which the Rescue Coordination Centres (RCCs) or SAR Points of Contact (SPOCs) of that particular region is notified discreetly.
- Once receiving the signal the national authorities of the area notified dispatch appropriate military or law-enforcement forces to deal with the terrorist or pirate menace.

The ship security alert system activation points shall be designed so as to prevent the inadvertent initiation of the ship security alert.

When an Administration receives notification of a ship security alert, that Administration shall immediately notify the State(s) in the vicinity of which the ship is presently operating.

When a Contracting Government receives notification of a ship security alert from a ship which is not entitled to fly its flag, that Contracting Government shall immediately notify the relevant Administration and, if appropriate, the State(s) in the vicinity of which the ship is presently operating.

Benefits:

- Fully maritime focused
- Use of the Inmarsat C, mini-C, D+ satellite service
- Up gradation over older GMDSS version.
- Global coverage
- Suitable for asset tracking
- Daily reports at routine priority
- Web based tracking
- Conforms to IMO standards and full compliance with the requirements of SOLAS 11.2/6
- Installation, testing, and instruction on usage by professionals.

I.S.P.S. code

International Ship and Port Facility Security (ISPS) Code: means the International Code for the Security of Ships and of Port Facilities consisting of Part A (the provisions of which shall be treated as mandatory) and part B (the provisions of which shall be treated as recommendatory), as adopted, on 12 December 2002

ISPS:

Chapter 11.2 of SOLAS describes ISPS regulations. ISPS code means International ship & port facilities security code, enforced in July 2004.

There are two parts in it:

- 1) Maritime safety &
- 2) Maritime security

There are 19 chapters in ISPS:

- 1) General
- 2) Definition
- 3) Application
- 4) Responsibilities of contacting government
- 5) Declaration of security
- 6) Obligation of company
- 7) Ship security
- 8) Ship security assessment
- 9) Ship security plan
- 10) Record
- 11) Company security officer
- 12) Ship security officer
- 13) Training, drill and exercise
- 14) Port facility security
- 15) Port facility security assessment
- 16) Port security plan
- 17) Port facility security officer
- 18) Training, drill and exercise at port
- 19) Verification and certification for ships

OBJECTIVE:

- **To detect security threats and take preventive measures against security incident affecting ships or port facilities used in international trade.**
- **To ensure confident that adequate and proportionate maritime security measures are in place.**
- **To ensure the early and efficient collection and exchange of security related information.**

There are three levels in ISPS: (SURVEYOR WILL ASK YOU TO TELL ONLY NAME)

LEVEL-1: Maintaining minimum appropriate protective security measure shall be maintained at all time.

(never say it's a NORMAL LEVEL 1 , he will kick you out)

LEVEL-2: Maintain additional protective security measure shall be maintained for period of time as a result of heightened risk of a security incident. (Heightened threat but no defined target.)

LEVEL-3: Further specific protective high level of security measure shall be maintained for a limited period

of time, High level of threat against a specific target.

SECURITY MEASURE:

@Level -1

- Adequate deck & over side lighting.
- Crew member should be issued photo identification.
- Access on & off the vessel should be control & all person identify.
- Access to certain area of the vessel to be limited with key control.
- Unused room or space should be kept locked.
- Periodic inspection/patrol should be made a regular interval.

@Level -2

In addition to level -1

- Occasional search should be made at random interval.
- Access of all visitors to the vessel should strictly control.
- Close security to be paid on deliveries and stores.
- Baggage should not be unattended.
- Check should make on seal on container & other cargo.
- No person other than crew member should be allowed on bridge or E/R.
- Maintain close liaison with shore concerned.
- All crewmembers should be reminded of bomb alert security of the vessel.

@Level-3

In addition to level 1 & 2:

- Very tight security
- Restricted area are totally closed
- 100% ship's store to be suspended
- Unless specifically advised otherwise No cargo operation shall take place
- Gangway is lifted
- No stores and bunkers will be loaded unless specifically instructed.
- Limiting access to a single & controlled access.
- Granting access only to those responding to the security incident.
- Carry out full or partial search of the ship.
- Suspending cargo-handling operation.
- Tighten security patrol of the vessel.
- Crew member should be briefed on seriousness of the situation.

RESTRICTED AREA:

- Navigation room
 - Radio room
 - Engine room
 - Steering room
 - Emergency generator area
 - Bow thruster
 - Fire control room
 - Crew accommodation area
 - Ventilation, air conditioning equipment room,
 - Similar key area which is essential to safe operation of ship.
- =====

Q 72: What the function of SSO,CSO,PFSO ?

Q 72 a: what is SSP ?

Q 72 b: who was your SSO and CSO?

A 72, 72 a, 72 b:

SHIP SECURITY PLAN (SSP)

PURPOSE:

- SSP means a plan developed to ensure the application of measures on board the ship designed to protect persons on board.
- The purpose of the plan is to lay down the responsibilities and the procedure to prevent and counteract any anticipated threat to the ship, its cargo and crew.

SSP must be written in the working languages of the ship, but a translation in English, French and Spanish

The SSP must address the following:

- Identification of restricted area and measures to prevent unauthorized access to such area.
- Measures to prevent unauthorized access to the ship.
- Measures to prevent unauthorized weapons, dangerous substance and devices intended to harm people.
- Procedures for responding to security threats or breaches of security.
- Duties of shipboard personnel assigned security responsibilities.
- Identification of the SSO.

- Procedure for reporting security incident.
- Identification of the CSO including 24 hour contact information.
- Location of the SSAS activation points.
- Procedures for security training, drills, and exercises.

SHIP SECURITY OFFICER (SSO)

- THE PERSON ON BOARD THE SHIP, ACCOUNTABLE TO THE MASTER, DESIGNATED BY THE Company as responsible for the security of the ship, including implementation and maintenance of the SSP and for liaison with the CSO and PFSO.

The duties and responsibilities of the SSO are:

- Proposing modification to the SSP.
- Reporting all security incidents.
- Ensuring that security equipment is properly operated, tested and maintained.
- Ensuring that adequate training has been provided to shipboard personnel
- Maintaining and supervising the implementation of the SSP
- Co-ordinating the security aspects of the handling of cargo and ship's store with other shipboard personnel and with the relevant PFSO
- Enhancing security awareness and vigilance on board

COMPANY SECURITY OFFICER (CSO)

- The person designated by the shipping company to be responsible for developing, implementing and maintaining individual SSP for all or part of the company fleet of ships.
- A company may designated more than one CSO as long as it is clear who is the CSO for a particular ship.

The duties and responsibilities of the CSO are:

- Supervising security assessments for each ship.
- Advising the level of threats likely to be encountered by the ship
- Ensuring that the SSP is modified as appropriate, to eliminate the deficiencies and satisfy the security requirements of the individual ship
- Arranging internal audits and reviews of security measures and activities.
- Enhancing security awareness and vigilance
- Ensuring effective communication and co-operation between the SSO and relevant PFSO.

- Ensuring that if a sister-ship or fleet security plans are used the plan for each ship reflects the ship specific information accurately.
- Ensuring adequate training for personnel responsible for the security of the ship.

PORT FACILITY SECURITY OFFICER (PFSO)

- PFSO shall be designated for each port facility.
- A person may be designated as the PFSO for one or more port facilities.

The duties and responsibilities of the PFSO are:

- Ensuring the development and maintenance of the port facility security plan.
- Undertaking regular security inspection of the port facility to ensure continuation of appropriate security measures.
- Ensuring adequate training has been provided to personnel responsible for the security of the port facility.
- Ensuring that standards for personnel responsible for security of the port facility are met.
- Assisting the SSO in confirming the identity of those seeking to board the ship when requested.
- Ensuring that security equipment is properly operated, tested and maintained.
- Co-ordination with security services as appropriate.

=====

Q 73: Explain AIS and LRIT?

A 73:

AUTOMATIC IDENTIFICATION SYSTEM (A.I.S)

- As per International Convention for the SOLAS required AIS onboard on International Voyage ship.
- Ship 300 GT and above required to fitted.
- AIS is an Automatic Tracking System used on ships and by Vessel Traffic Service (VTS) for identifying and locating vessels by electronically exchanging data with other nearby ships, AIS base station and satellite.
- When satellite are used to detect AIS signature then the term S-AIS used.
- AIS assist vessel's watch keeping officer and allow maritime authority to track and monitor vessel movement.

Information provide by AIS:

- Unique Identification number of the vessel
- Position of the vessel
- Course of the vessel
- Speed of the vessel

LONG-RANGE IDENTIFICATION AND TRACKING OF SHIPS

SOLAS CHAPTER 5

REGULATION 19.1

ADOPTED 19TH MAY 2006 BY IMO

Apply :

- All passenger ships
- High speed craft
- Cargo ship 300 GT and above
- MODU
- Ships must report their location to their flag administration at least 4 times in a day.
- Most ship set their existing satellite communication system to automatic make these report.
- LRIT consist :
 - Ship borne satellite
 - Communication equipment
 - Communication service provider (CSP)
 - Application service provider (ASP)
 - LRIT data Centre.
 - LRIT data distribution plan
 - LRIT data exchange

=====

Q 74: Explain function of VDR (Voyage Data Recorder) ?

A 74:

VDR (VOYAGE DATA RECORDER)

- Which is recorder data from various sensor on board the vessel.
- And it will store all data in storage unit.
- Storage unit is designed to withstand the extreme shock, pressure and heat.

MEO CLASS 4 SAFETY (COSCPPOOL) ORAL PREPARATION FILE PART 4

- If any incident happens than last 24 hour of stored data from the storage unit can be recorded for any investigation.

Data to be Recorded are :

- Position of ship
 - Date, Time, speed
 - VHF radio communication
 - All alarm history
 - Water tight & Weather tight door status as indicate on bridge
 - Audio from bridge including bridge wing.
-
-

Q 75: Name only all ANNEX in order? (First attempt guys most favorite question for you is this if you can't able to give answer this question you will fail all paper)

A 75:

MARPOL ANNEX 73/78 NAME ONLY

- 1. Annex I of MARPOL 73/78: Regulations for the Prevention of Pollution by Oil.***
 - 2. Annex II of MARPOL 73/78: Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk.***
 - 3. Annex III of MARPOL 73/78: Regulations for the Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form.***
 - 4. Annex IV of MARPOL 73/78: Regulations for the Prevention of Pollution by Sewage from Ships.***
 - 5. Annex V of MARPOL 73/78: Regulations for the Prevention of Pollution by Garbage from Ships.***
 - 6. Annex VI of MARPOL 73/78: Regulations for the Prevention of Air Pollution from Ships.***
- =====

Q 76: Explain ANNEX 1 in detail?

Q 76 a: Explain ORB PART 1 & 2 in detail with proper entries?

Q 76 b: Explain SOPEP regulation and its equipment?

Q 76 c: Explain Discharge Criteria for oil and Bilge ?

Q 76 d: Can we discharge oil without filtering equipment ?

Q 76 e: Where you can't discharge oil and sludge? Or Special area under this annex ?

A 76, 76 a, 76 b, 76 c, 76 d, 76 e:

Friend this Annex is most important those who sailed on Tanker, surveyor mostly asking you Discharge Criteria for oil, sludge. He can ask you about ORB entries either weekly or periodically, SOPEP and its equipment, COW and its procedure, about SBT and its regulation.

Friend you need not have to tell him every thing but the point you will answer it should be perfect with all regulation.

Some times surveyor will confuse in some topic, but if you are sure and confident with your answer plz don't change your answer.

ANNEX 1

ANNEX 1: Regulations for the Prevention of Pollution by Oil

APPLY TO : All ship

CERTIFICATE UNDER THIS ANNEX:

- IOPP: INTERNATIONAL OIL POLLUTION PREVENTION CERTIFICATE (valid 5 year)

TOTAL NO OF REGULATION: CHAPTER =7 and REGULATION= 39

Here I will explain only few most important Regulation, rest all are not necessary but if you have time and you want to know more than please refer MARPOL latest addition book.

Chapter 3

- Regulation 12 Tanks for oil residues (sludge)
- Regulation 13 Standard discharge connection
- Regulation 14 Oil filtering equipment
- Regulation 15 Control of operational discharge of oil
- Regulation 16 Segregation of oil and water ballast and carriage of oil in forepeak tanks
- Regulation 17 Oil Record Book part 1- Machinery space operations

Chapter 4 Requirement for the cargo area of oil tankers

- Regulation 18 Segregated ballast tanks
- Regulation 29 Slop tanks
- Regulation 31 Oil discharge monitoring and control system
- Regulation 34 Control of discharge of oil
- Regulation 35 Crude oil washing operations
- Regulation 36 Oil record book part 2 – cargo/ballast operations

Chapter 5 Prevention of pollution arising from an oil pollution incident

- Regulation 37 Shipboard oil pollution emergency plan

Surveys:

- Every oil tanker of 150 tons gross tonnage and above, and every other ship of 400 tons gross tonnage and above shall be subject to the surveys specified below:
 - (a) An initial survey before the ship is put in service or before the Certificate**
 - for the first time, which shall include a complete survey of its structure, equipment, systems, fittings, arrangements and material in so far as the ship is covered by this Annex.
 - This survey shall be such as to ensure that the structure, equipment, systems, fittings, arrangements and material fully comply with the applicable requirements of this Annex.
 - (b) A renewal survey at intervals specified by the Administration, but not exceeding five years**
 - The renewal survey shall be such as to ensure that the structure, equipment, systems, fittings, arrangements and material fully comply with applicable requirements of this Annex.
 - (c) An intermediate survey within three months before or after the second anniversary date or within three months before or after the third anniversary date of the Certificate**
 - The intermediate survey shall be such as to ensure that the equipment and associated pump and piping systems, including oil discharge monitoring and control systems, crude oil washing systems, oily-water separating equipment and oil filtering systems, fully comply with the applicable requirements of this Annex and are in good working order.
 - Such intermediate surveys shall be endorsed on the Certificate issued under regulation 5 or 6 of this Annex.
 - (d) An annual survey within three months before or after each anniversary date of the Certificate**
 - a general inspection of the structure, equipment, systems, fittings, arrangements and material.
 - Such annual surveys shall be endorsed on the Certificate issued under regulation 5 or 6 of this Annex.

STANDARD DISCHARGE CONNECTION FOR BILGE OR SLUDGE FLANGE

- To enable pipes of reception facilities to be connected with the ship's discharge pipeline for residues from machinery bilges, both lines shall be fitted with a standard discharge connection

Description	Dimension
Outside diameter	215 mm
Inner diameter	According to pipe outside diameter
Bolt circle diameter	183 mm
Slots in flange	6 holes 22 mm in diameter equidistantly placed on a bolt circle of the above diameter, slotted to the flange periphery. The slot width to be 22 mm
Flange thickness	20 mm
Bolts and nuts: quantity and diameter	6, each of 20 mm in diameter and of suitable length

- The flange is designed to accept pipes up to a maximum internal diameter of 125 mm and shall be of steel or other equivalent material having a flat face.*
- This flange, together with a gasket of oil-proof material, shall be suitable for a service pressure of 600 kPa*

OIL FILTERING EQUIPMENT

- Any ship of 400 tons gross tonnage and above but less than 10,000 tons gross tonnage shall be fitted with oil filtering equipment and with arrangements for an alarm and for automatically stopping any discharge of oily mixture when the oil content in the effluent exceeds 15 parts per million.
- It shall be provided with alarm arrangements to indicate when this level cannot be maintained.
- The system shall also be provided with arrangements such as will ensure that any discharge of oily mixtures is automatically stopped when the oil content of the effluent exceeds 15 parts per million.

CONTROL OF DISCHARGE OF OIL

NOTE:

Generally surveyor asking this topic from the Annex 1 , so you have to explain this criteria only with proper regulation.

*Any discharge into the sea of oil or oily mixtures **from ships of 400 gross tonnage and above** shall be prohibited except when all the following conditions are satisfied:*

DISCHARGE CRITERIA OUTSIDE SPECIAL AREA

- The ship is proceeding en route.
- The oily mixture is processed through an oil filtering equipment.
- The oil content of the effluent without dilution does not exceed 15 ppm
- The oily mixture does not originate from cargo pump-room bilges on oil tankers.
- The oily mixture in case of oil tanker is not mixed with oil cargo residues.

DISCHARGE CRITERIA IN SPECIAL AREA

- The ship is proceeding en route.
- The oily mixture is processed through an oil filtering equipment.
- The oil content of the effluent without dilution does not exceed 15 ppm
- The oily mixture does not originate from cargo pump-room bilges on oil tankers.
- The oily mixture in case of oil tanker is not mixed with oil cargo residues.

In Antarctic area any discharge into sea of oil or oily mixture from ant ship is PROHIBITED

*Any discharge into the sea of oil or oily mixtures **from ships of less than 400 gross tonnage,** oil and all oily mixture shall either be retained on board for subsequent discharge to reception facilities or discharge into sea except when all the following conditions are satisfied:*

- The ship is proceeding en route.
- The ship has in operation equipment of a design approved by the Administration that ensures that the oil content of the effluent without dilution does not exceed 15 ppm
- The oily mixture does not originate from cargo pump-room bilges on oil tankers.
- The oily mixture in case of oil tanker is not mixed with oil cargo residues.

CONTROL OF OPERATIONAL DISCHARGE OF OIL (BILGE)

Any discharge into the sea of oil or oily mixtures from ships to which this Annex applies shall be prohibited except when all the following conditions are satisfied:

DISCHARGE CRITERIA OUTSIDE SPECIAL AREA

- The tanker is not within a special area
- The tanker is more than 50 nautical miles from the nearest land.
- The tanker is proceeding en route.
- The instantaneous rate of discharge of oil content does not exceed 30 liters per nautical mile.
- The total quantity of oil discharged into the sea does not exceed for existing tankers 1/15,000 of the total quantity of the particular cargo of which the residue formed a part, and for new tankers 1/30,000 of the total quantity of the particular cargo of which the residue formed a part.
- The tanker has in operation an oil discharge monitoring and control system and a slop tank arrangement.

DISCHARGE CRITERIA IN SPECIAL AREA

- **Anything is PROHIBITED**

OIL RECORD BOOK PART 1 & 2

- Every oil tanker of 150 tons gross tonnage and above and every ship of 400 tons gross tonnage and above other than an oil tanker shall be provided with an Oil Record Book Part I (Machinery Space Operations).
- Every oil tanker of 150 tons gross tonnage and above shall also be provided with an Oil Record Book Part II (Cargo/Ballast Operations).
- **Each completed operation shall be signed for and dated by the officer or officers in charge.**
- **Each completed page shall be signed by the master of the ship.**
- The entries in the Oil Record Book shall be in an official language of the State whose flag the ship is entitled to fly, and, for ships holding an International Oil Pollution Prevention Certificate, in English or French.
- The entries in an official national language of the State whose flag the ship is entitled to fly shall prevail in case of a dispute or discrepancy.
- The Oil Record Book shall be kept in such a place as to be readily available for inspection at all reasonable times and, except in the case of unmanned ships under tow, shall be kept on board the ship.

- It shall be preserved for a period of three years after the last entry has been made.

OIL RECORD BOOK PART 1- MACHINERY SPACE OPERATIONS ENTRIES:

Every oil tanker of 150 tons gross tonnage and above and every ship of 400 tons gross tonnage and above other than an oil tanker shall be provided with an Oil Record Book Part I (Machinery Space Operations).

1. Ballasting or cleaning of oil fuel tanks

- Identity of tank(s) ballasted.
- Whether cleaned since they last contained oil and, if not, type Of oil previously carried.
- Cleaning process:
 - ❖ position of ship and time at the start and completion of cleaning;
 - ❖ identify tank(s) in which one or another method has been employed (rinsing through, steaming, cleaning with chemicals; type and quantity of chemicals used);
- Identity of tank(s) into which cleaning water was transferred.
- Ballasting:
 - ❖ position of ship and time at start and end of ballasting;
 - ❖ quantity of ballast if tanks are not cleaned.

2. Discharge of dirty ballast or cleaning water from oil fuel tanks

- Identity of tank(s).
- Position of ship at start of discharge.
- Position of ship on completion of discharge.
- Ship's speed(s) during discharge.
- Method of discharge:
 - ❖ through 15 ppm equipment;
 - ❖ to reception facilities.
- Quantity discharged.

3. Collection and disposal of oil residues (sludge)

- Collection of oil residues.
- Quantities of oil residues (sludge) retained on board at the end of a voyage, but not more frequently than once a week.
- When ships are on short voyages, the quantity should be recorded weekly.
- Methods of disposal of residue.
- State quantity of oil residues disposed of, the tank(s) emptied and the quantity of contents retained:

4. Non-automatic discharge overboard or disposal otherwise of bilge water which has accumulated in machinery spaces

- Quantity discharged or disposed of.
- Time of discharge or disposal (start and stop).
- Method of discharge or disposal:
 - ❖ through 15 ppm equipment (state position at start and end);
 - ❖ to reception facilities (identify port);2
 - ❖ transfer to slop tank or holding tank (indicate tank(s); state quantity transferred and the total quantity retained in tank(s)).

5. Automatic discharge overboard or disposal otherwise of bilge water which has accumulated in machinery spaces

- Time and position of ship at which the system has been put into automatic mode of operation for discharge overboard.
- Time when the system has been put into automatic mode of operation for transfer of bilge water to holding tank (identify tank).
- Time when the system has been put into manual operation.
- Method of discharge overboard:
 - ❖ through 15 ppm equipment.

6. Condition of oil discharge monitoring and control system

- Time of system failure.
- Time when system has been made operational.
- Reasons for failure.

7. Accidental or other exceptional discharges of oil

- Time of occurrence.
- Place or position of ship at time of occurrence.
- Approximate quantity and type of oil.
- Circumstances of discharge or escape, the reasons therefor and general remarks.

8. Bunkering of fuel or bulk lubricating oil

- Bunkering:
 - ❖ Place of bunkering.
 - ❖ Time of bunkering.
 - ❖ Type and quantity of fuel oil and identity of tank(s) (state quantity added and total content of tank(s)).

- ❖ Type and quantity of lubricating oil and identity of tank(s) (state quantity added and total content of tank(s)).

9. Additional operational procedures and general remarks

OIL RECORD BOOK PART 2- CARGO /BALLAST OPERATIONS ENTRIES:

Every oil tanker of 150 tons gross tonnage and above shall also be provided with an Oil Record Book Part II (Cargo/Ballast Operations).

1. Loading of oil cargo

- Place of loading.
- Type of oil loaded and identity of tank(s).
- Total quantity of oil loaded (state quantity added and the total content of tank(s))

2. Internal transfer of oil cargo during voyage

- Identity of tank(s)
- from to (state quantity transferred and total quantity of tank(s))

3. Unloading of oil cargo

- Place of unloading.
- Identity of tank(s) unloaded.

4. Crude oil washing (COW tankers only) (To be completed for each tank being crude oil washed)

- Port where crude oil washing was carried out or ship position if carried out between two discharge ports.
- Identity of tank(s) washed.
- Time of start & stop of washing.
- Washing pattern & washing line pressure.

5. Ballasting of cargo tanks

- Position of ship at start and end of ballasting.
- identity of tank(s) ballasted
- quantity of ballast received. Indicate total quantity of ballast for each tank involved in the operation.

6. Ballasting of dedicated clean ballast tanks (CBT tankers only)

- Identity of tank(s) ballasted.
- Position of ship when water intended for flushing, or port ballast was taken to dedicated clean ballast tank(s).
- Quantity of the oily water which, after line flushing, is transferred to the slop tank(s) or cargo tank(s) in which slop is preliminarily stored (identify tank(s)).
- Position of ship when additional ballast water was taken to dedicated clean ballast tank(s).
- Quantity of clean ballast taken on board.

7. Cleaning of cargo tanks

- Identity of tank(s) cleaned.
- Port or ship's position.
- Method of cleaning.
- Tank washings transferred to:
 - ❖ reception facilities (state port and quantity)
 - ❖ slop tank(s) or cargo tank(s) designated as slop tank(s)

8. Discharge of dirty ballast

- Identity of tank(s).
- Position of ship at start & stop of discharge into the sea.
- Quantity discharged into the sea.
- Ship's speed(s) during discharge.
- Was the discharge monitoring and control system in operation during the discharge?
- Was a regular check kept on the effluent and the surface of the water in the locality of the discharge?
- Discharged to shore reception facilities (identify port and quantity involved).

9. Discharge of water from slop tanks into the sea

- Identity of slop tanks.
- Time of settling from last entry of residues.
- Time of settling from last discharge.
- Ullage of total contents at start of discharge.
- Ullage of oil/water interface at start of discharge.
- Final quantity discharged and rate of discharge.
- Confirm that all applicable valves in the ship's piping system have been closed on completion of discharge from the slop tanks.

10. Disposal of residues

- Identity of tank(s)
- Quantity disposed of from each tank. (State the quantity retained.)
- Method of disposal:
 - ❖ to reception facilities (identify port and quantity involved);5
 - ❖ mixed with cargo (state quantity);
 - ❖ transferred to (an)other tank(s) (identify tank(s); state quantity

SHIPBOARD OIL POLLUTION EMERGENCY PLAN (SOPEP)

- Every oil tanker of 150 tons gross tonnage and above and every ship other than an oil tanker of 400 tons gross tonnage and above shall carry on board a shipboard oil pollution emergency plan approved by the Administration.
- In the case of ships built before 4 April 1993 this requirement shall apply 24 months after that date.
- Such a plan shall be in accordance with guidelines developed by the Organization and written in the working language of the master and officers.
- The plan shall consist at least of:
 - The procedure to be followed by the master or other persons having charge of the ship to report an oil pollution incident.
 - The list of authorities or persons to be contacted in the event of an oil pollution incident.
 - A detailed description of the action to be taken immediately by persons on board to reduce or control the discharge of oil following the incident.
 - The procedures and point of contact on the ship for coordinating shipboard action with national and local authorities in combating the pollution.

OIL SPILL EQUIPMENT/ SOPEP EQUIPMENT

Saw dust	Non-spark scoop
Scupper plug	Non-spark pump
Sorbent pillows	Weldon pump
Nitrile gloves	Buckets
Protective goggles	Heavy duty brooms
Disposable suit	OSD (oil spill dispersant)
Quick absorbent pads	Cotton rags
Brushes	Drum to collect oil 200 ltr capacity

SPECIAL AREA UNDER THIS ANNEX: (Total 10)

- The Mediterranean Sea area
- The Baltic Sea area
- The Black Sea area
- The Red Sea area
- The Gulfs area
- The Gulf of Aden area
- The North West European water include North sea area
- The Antarctic area
- The Oman area
- The Southern South African area

IOPP CERTIFICATE CONTENT: (*sometimes surveyor asked this question*)

INTERNATIONAL OIL POLLUTION PREVENTION CERTIFICATE

- **Particulars of ship**
 - Name of ship
 - Distinctive number or letters
 - Port of registry
 - Gross tonnage
 - Deadweight of ship (metric tons)
 - IMO Number
 - **Type of ship:**
 - **Validity**
 - **Issued date**
 - **Signature of authorized official issuing the certificate**
 - **ENDORSEMENT FOR ANNUAL AND INTERMEDIATE SURVEYS**
 - Annual/Intermediate survey
 - **ENDORSEMENT TO EXTEND THE CERTIFICATE IF VALID FOR LESS THAN 5 YEARS**
-

Q 77: Explain ANNEX 2 and its Regulation?

Q 77 a: Discharge criteria for X,Y,and Z category?

A 77, 77 a:

ANNEX 2

ANNEX 2 :Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk

APPLY TO:

Annex shall apply only to ships carrying substances which are categorized for discharge control purposes in Category A, B or C.

TOTAL NO OF REGULATION = 16

- Regulation 1 Definitions
- Regulation 2 Application
- Regulation 3 Categorization and listing of noxious liquid substances
- Regulation 4 Other liquid substances
- Regulation 5 Discharge of noxious liquid substances
- Regulation 5 A Pumping, piping and unloading arrangements
- Regulation 6 Exceptions
- Regulation 7 Reception facilities and cargo unloading terminal arrangements
- Regulation 8 Measures of control
- Regulation 9 Cargo Record Book
- Regulation 10 Surveys
- Regulation 11 Issue or endorsement of Certificate
- Regulation 12 Duration and validity of Certificate
- Regulation 12A Survey and certification of chemical tankers
- Regulation 13 Requirements for minimizing accidental pollution
- Regulation 14 Carriage and discharge of oil-like substances
- Regulation 15 Port State control on operational requirements
- Regulation 16 Shipboard marine pollution emergency plan for noxious liquid substances

- **Chemical tanker** means a ship constructed or adapted primarily to carry a cargo of noxious liquid substances in bulk and includes an “oil tanker”.

Categorization and listing of noxious liquid substances:

- **Category A:** Noxious liquid substances which if discharged into the sea from tank cleaning or deballasting operations would present a major hazard to either marine resources or human health or cause serious harm to amenities or other legitimate uses of the sea and therefore justify the application of stringent anti-pollution measures.
- **Category B:** Noxious liquid substances which if discharged into the sea from tank cleaning or deballasting operations would present a hazard to either marine resources or human health or cause harm to amenities or other legitimate uses of the sea and therefore justify the application of special anti-pollution measures.
- **Category C:** Noxious liquid substances which if discharged into the sea from tank cleaning or deballasting operations would present a minor hazard to either marine resources or human health or cause minor harm to amenities or other legitimate uses of the sea and therefore require special operational conditions.
- **Category D:** Noxious liquid substances which if discharged into the sea from tank cleaning or deballasting operations would present a recognizable hazard to either marine resources or human health or cause minimal harm to amenities or other legitimate uses of the sea and therefore require some attention in operational conditions.

Discharge of noxious liquid substances:

Category A, B and C substances outside special areas and Category D substances in all areas

The discharge into the sea of substances in Category A

- The resulting residues shall be discharged to a reception facility until the concentration of the substance in the effluent to such facility is at or below 0.1% by weight and until the tank is empty, with the exception of phosphorus, yellow or white, for which the residual concentration shall be 0.01% by weight.
- the ship is proceeding en route at a speed of at least 7 knots in the case of self-propelled ships or at least 4 knots in the case of ships which are not self-propelled;
- the discharge is made below the waterline, taking into account the location of the seawater intakes; and
- the discharge is made at a distance of not less than 12 nautical miles from the nearest land in a depth of water of not less than 25 m.

The discharge into the sea of substances in Category B

- the ship is proceeding en route at a speed of at least 7 knots in the case of self-propelled ships or at least 4 knots in the case of ships which are not self-propelled.
- the procedures and arrangements for discharge are approved by the Administration.
- Such procedures and arrangements shall be based upon standards developed by the Organization and shall ensure that the concentration and rate of discharge of the effluent is such that the concentration of the substance in the wake astern of the ship does not exceed 1 part per million.
- the maximum quantity of cargo discharged from each tank and its associated piping system does not exceed the maximum quantity approved in accordance with the procedures referred to which shall in no case exceed the greater of 1 m³ or 1/3,000 of the tank capacity in m³.
- the discharge is made below the waterline, taking into account the location of the seawater intakes
- the discharge is made at a distance of not less than 12 nautical miles from the nearest land and in a depth of water of not less than 25 m.

The discharge into the sea of substances in Category C

- the ship is proceeding en route at a speed of at least 7 knots in the case of self-propelled ships or at least 4 knots in the case of ships which are not self-propelled.
- the procedures and arrangements for discharge are approved by the Administration. Such procedures and arrangements shall be based upon standards developed by the Organization and shall ensure that the concentration and rate of discharge of the effluent is such that the concentration of the substance in the wake astern of the ship does not exceed 10 parts per million.
- the maximum quantity of cargo discharged from each tank and its associated piping system does not exceed the maximum quantity approved in accordance with the procedures referred to which shall in no case exceed the greater of 3 m³ or 1/1,000 of the tank capacity in m³.
- the discharge is made below the waterline, taking into account the location of the seawater intakes; and the discharge is made at a distance of not less than 12 nautical miles from the nearest land and in a depth of water of not less than 25 m.

The discharge into the sea of substances in Category D

- the ship is proceeding en route at a speed of at least 7 knots in the case of self-propelled ships or at least 4 knots in the case of ships which are not self-propelled
- such mixtures are of a concentration not greater than one part of the substance in ten parts of water.
- the discharge is made at a distance of not less than 12 nautical miles from the nearest land.

Q 78: Explain ANNEX 3 in detail?

Q 78 a: IMDG CODE?

Q 78 b: Name only the class of D.G ?

Q 78 c: In which chapter of SOLAS IMDG code will mentioned?

A 78, 78 a, 78 b, 78 c:

ANNEX 3 (IMDG CODE) (SOLAS CHAPTER 7)

ANNEX 3: Regulation for the prevention of pollution by HARMFUL SUBSTANCE carried by sea in packaged form.

APPLY TO :

This annex apply to all ship carrying Harmful Substance in packaged form or in freight container, portable tanks or road and rail tank wagons.

Packaged form means the forms of containment specified for harmful substances in the IMDG Code.

NOT APPLICABLE : Ship's store & Equipment

TOTAL NO OF REGULATION = 8

- Regulation 1 Application
- Regulation 2 Packing
- Regulation 3 Marking and labeling
- Regulation 4 Documentation
- Regulation 5 Stowage
- Regulation 6 Quantity limitations
- Regulation 7 Exceptions
- Regulation 8 Port State control on operational requirements

NOTE:

Now friend after said above you have to say " Sir, in this annex is all about IMDG code" than friend explain which I mentioned below. Most important thing is if you can remember all Regulation name than it's good but if u can't than never said one or two regulation name just skip it.

IMDG CODE

- The **International Maritime Dangerous Good Code** contains detailed Technical specifications to enable dangerous goods to be transported safely by sea.
- The IMDG Code became Mandatory in International law on 1st January 2004

APPLY TO:

- All ship which carry harmful substance.

HARMFUL SUBSTANCE means:

Those substances which are identified as "MARINE POLLUTANT" in IMDG code.

OBJECTIVE

- **ENHANCE THE SAFE TRANSPORT OF DANGEROUS GOODS.**
- **PROTECT THE MARINE ENVIRONMENT.**
- **FACILITATE THE FREE UNRESTRICTED MOVEMENT OF DANGEROUS GOODS.**

LAYOUT OF THE CODE:

- The code is composed of 7 parts
- The code is presented in two books, volume 1 and volume 2
- It is necessary to use both books to obtain the required information when shipping dangerous goods by sea.

VOLUME 1:

- **Part 1:** General provisions, definitions and training
- **Part 2:** Classification
- **Part 4:** Packing and Tank Provisions
- **Part 5:** Consignment Procedures
- **Part 6:** Construction and Testing of Packaging, Intermediate Bulk Containers (IBCs), Large Packaging, Portable Tanks, Multiple-Element Gas Containers (MEGC'S) and Road Tank Vehicles.

VOLUME 2 :

- **Part 3:** Dangerous Goods List (DGL) and Limited Quantities Exceptions
- The DGL is the central core of the IMDG Code and presents information on the transport requirements for all dangerous goods in a coded form.

PRINCIPLE OF IMDG CODE:

The IMDG Code is based on an internationally agreed system which are:

- **CLASSIFICATION:** in where the D.G is together divided into groups based on the hazards they present during transport.
- **PACKAGING:** in where the D.G is packaged for appropriate strength and which will prevent the D.G to be escape.
- **MARKING/LABELING:** in where on package good they used hazards warning labels and other identification marks to identify the D.G in transport.
- **DOCUMENT:** in where to transport this kind of D.G we required some standard document for particular of the D.G.
- **SEGREGATION:** in where the D.G if we kept together it will danger, so these D.G are should be segregate apart.

CLASSIFICATION

Purpose - to identify

- types of danger / hazard
- substances which are incompatible with each other, and
- the amount of danger in moving particular chemical

CLASSES: *(He can only ask you to name of the class, you have to say in order only)*

- **Class 1:** Explosive
- **Class 2:** Gases
- **Class 3:** Flammable Liquid
- **Class 4:** Flammable Solid, Spontaneous combustion when comes in contact of H₂O
- **Class 5:** Oxidizing substance & Organic peroxides
- **Class 6:** Toxic and Inflection substance.
- **Class 7:** Radioactive material
- **Class 8:** Corrosive substance
- **Class 9:** Miscellaneous Dangerous substance & Article

PSN (PROPER SHIPPING NAME):

Examples :

- UN 0209 - Trinitrotoluene (TNT)
- UN 1223 - Kerosene
- UN 1993 - Flammable liquid N.O.S.
- UN 3175 - Solids containing flammable liquids N.O.S., where UN (UNITED NATION) number.

PACKAGING

They are divided into 3 groups

Indicates the 'Degree of danger'

- Packaging Group I : Great danger
- Packaging Group II : Medium danger
- Packaging Group III : Minor danger

PG concept is not applicable to explosives, gases, organic peroxides, infectious substances & radioactive materials.

- The transport of dangerous goods is associated with special risks because of the properties of the transported substances, being for example flammable or corrosive.
- The Packaging has an extremely important role with respect to minimizing such risks - if the dangerous substance cannot escape from its packaging it normally cannot cause accidents.

PACKAGING FORMS :

Example:

- DRUMS
- WOODEN BARREL
- JERRICAN
- BOX
- BAG
- COMPOSITE PACKAGING



MARKING / LABELLING

- UN Number
- Proper Shipping Name (PSN)
- Hazard Labels (diamond shaped) to indicate class/ division - primary & if necessary, secondary labels
Each package (drum, cylinder, sack) must be labelled in a specified format & sizes
- Risk phrase & Safety phrase
- UN Package Specification Marking
- Name & address of the manufacturer, importer, etc.

These labels have the type of hazard class written on them.



Friend this kind of Diamond Shape sticker along with Class number must be stacked on package.

There are both premium indoor and outdoor imprintable Laser and Thermal Transfer drum labels. All labels are specially die-cut to meet the recommended standards for cut-sheet laser printers.

- ***The method of marking the correct technical name and of affixing labels on packages containing a harmful substance shall be such that this information will still be identifiable on packages surviving at least three months' immersion in the sea.***



DOCUMENTATION

- In all documents relating to the carriage of harmful substances by sea where such substances are named, the correct technical name of each such substance shall be used (trade names alone shall not be used) and the substance further identified by the addition of the words “MARINE POLLUTANT”.
- The shipping documents supplied by the shipper shall include, or be accompanied by, a signed certificate or declaration that the shipment offered for carriage is properly packaged and marked, labelled or placarded as appropriate and in proper condition for carriage to minimize the hazard to the marine environment.
- Each ship carrying harmful substances shall have a special list or manifest setting forth the harmful substances on board and the location thereof.
- A detailed stowage plan which sets out the location of the harmful substances on board may be used in place of such special list or manifest.
- Copies of such documents shall also be retained on shore by the owner of the ship or his representative until the harmful substances are unloaded.
- A copy of one of these documents shall be made available before departure to the person or organization designated by the port State authority.

For carrying document we can come to know:

- What is being carried?
- Where it is stowed?
- How to deal with emergencies?
- How it is packed?

Inside Document details are:

- Proper Shipping Name (PSN)
- UN Number
- Class & where appropriate, the Division & Compatibility group
- Description of the goods
- Gross mass or volume
- Transport emergency cards (TREM cards)

STOWAGE

- Harmful substances shall be properly stowed and secured so as to minimize the hazards to the marine environment without impairing the safety of the ship and persons on board.

Port State control on operational requirements

- A ship when in a port of another Party is subject to inspection by officers duly authorized by such Party concerning operational requirements under this Annex, where there are clear grounds for believing that the master or crew are not familiar with essential shipboard procedures relating to the prevention of pollution by harmful substances.
 - The Party shall take such steps as will ensure that the ship shall not sail until the situation has been brought to order in accordance with the requirements of this Annex
- =====

Q 79: Explain ANNEX 4 in detail?

Q 79 a: Explain Sewage Holding Tank regulation?

Q 79 b: Special area under this ANNEX?

Q 79 c: Define Black water and grey water?

A 79, 79 a, 79 b, 79 c:

ANNEX 4

ANNEX 4: Regulations for the Prevention of Pollution by Sewage from Ships

APPLY TO:

- New ships of 400 tons gross tonnage and above;
- New ships of less than 400 tons gross tonnage which are certified to carry more than 15 persons;
- Existing ships of 400 tons gross tonnage and above, 5 years after the date of entry into force of this Annex.
- Existing ships of less than 400 tons gross tonnage which are certified to carry more than 15 persons, 5 years after the date of entry into force of this Annex; and

TOTAL NO OF REGULATION : 12

CHAPTER 1 General

- Regulation 1 Definitions
- Regulation 2 Application
- Regulation 3 Exception

CHAPTER 2 Surveys and Certification

- Regulation 4 Surveys
- Regulation 5 Issue or endorsement of Certificate
- Regulation 6 Issue or endorsement of Certificate by another Government
- Regulation 7 Form of Certificate
- Regulation 8 Duration and Validity of Certificate

CHAPTER 3 Equipment and Control of Discharge

- Regulation 9 Sewage system
- Regulation 10 Standard discharge connection
- Regulation 11 Discharge of Sewage

CHAPTER 4 Reception Facility

- Regulation 12 Reception facility

SEWAGE: Drainage and other wastes from any form of toilets, urinals, and WC scupper, drainage from medical premises (dispensary, sick bay, etc.) via wash basins, wash tubs and scuppers located in such premises, drainage from spaces containing living animals, or other waste waters when mixed with the drainages.

Surveys:

- Every ship which is required to comply with the provisions of this Annex and which is engaged in voyages to ports or offshore terminals under the jurisdiction of other Parties to the Convention shall be subject to the surveys specified below

(a) An initial survey before the ship is put in service

- when the ship is fitted with a sewage treatment plant the plant shall meet operational requirements based on standards and the test methods developed by the Organization.
- when the ship is fitted with a system to comminute and disinfect the sewage, such a system shall be of a type approved by the Administration;
- when the ship is equipped with a holding tank the capacity of such tank shall be to the satisfaction of the Administration for the retention of all sewage having regard to the operation of the ship, the number of persons on board and other relevant factors.
- The holding tank shall have a means to indicate visually the amount of its contents; and
- that the ship is equipped with a pipeline leading to the exterior convenient for the discharge of sewage to a reception facility and that such a pipeline is fitted with a standard shore connection in compliance with regulation.
- This survey shall be such as to ensure that the equipment, fittings, arrangements and material fully comply with the applicable requirements of this Annex.

(b) Periodical surveys at intervals specified by the Administration but not exceeding five years

- which shall be such as to ensure that the equipment, fittings, arrangements and material fully comply with the applicable requirements of this Annex.
- However, where the duration of the International Sewage Pollution Prevention Certificate (1973) is extended as specified in regulation 7(2) or (4) of this Annex, the interval of the periodical survey may be extended correspondingly.

SPECIAL AREA UNDER THIS ANNEX : The Baltic Sea are

Discharge of sewage Regulation:

- The ship is discharging comminuted and disinfected sewage using a system approved by the Administration in accordance at a distance of more than 3 nautical miles from the nearest land.
- sewage which is not comminuted or disinfected at a distance of more than 12 nautical miles from the nearest land.
- In any case, the sewage that has been stored in holding tanks shall not be discharged instantaneously but at a moderate rate when the ship is en route and proceeding at not less than 4 knots.
- The rate of discharge shall be approved by the Administration based upon standards developed by the Organization.
- **Additionally, the effluent shall not produce visible floating solids in, nor cause discoloration of, the surrounding water.**
- When the sewage is mixed with wastes or waste water having different discharge requirements, the more stringent requirements shall apply.

Standard dimensions of flanges for discharge connections

Description	Dimension
Outside diameter	210 mm
Inner diameter	According to pipe outside diameter
Bolt circle diameter	170 mm
Slots in flange	4 holes 18 mm in diameter equidistantly placed on a bolt circle of the above diameter, slotted to the flange periphery. The slot width to be 18 mm
Flange thickness	16 mm
Bolts and nuts: quantity and diameter	4, each of 16 mm in diameter and of suitable length

- *The flange is designed to accept pipes up to a maximum internal diameter of 100 mm and shall be of steel or other equivalent material having a flat face. This flange, together with a suitable gasket, shall be suitable for a service pressure of 6 kg/cm²*
- *For ships having a moulded depth of 5 m and less, the inner diameter of the discharge connection may be 38 mm.*

REGULATION FOR SEWAGE HOLDING TANKS:

Applies to all ships that are:

- 400 gross tons or more, and
- Less than 400 gross tons but certified to carry more than 15 persons.
- A holding tank which is in accordance with the requirement developed by the Classification Society, which should include the amount of fluid, used to transport waste to the holding tank, the number of persons carried and the type of voyage the ship will be employed.
- The device is installed in accordance with the society's electrical standards.
- The piping and installation are in accord with good marine practice and the standards of the Classification Society, and
- A pipeline for the discharge of sewage to a shore side reception facility is properly installed.
- Be installed as far away as possible from heat sources that can accelerate the growth of bacteria.
- Be adequately vented to ensure that there are sufficient changes of air to remove any methane gases that may build up.
- Shall have vents that are located away from any accommodation and work spaces and shall be screened to prevent the entry of insects and to act as a flame barrier should gases build up in the tank.
- The design of the tank and its associated equipment (pumps, piping and water supply) shall be sufficient to ensure the tanks can be completely discharged and flushed clean.

BLACK WATER: *Water from washbasin, from hospital, wash tubes, scrapper known as.*

GREY WATER: *Waste water generated through bathing, galley known as.*

=====

Q 80: Explain ANNEX 5 in detail?

Q 80 a: Explain GRB entry ?

Q 80 b: Explain New Discharge Regulation about Garbage?

Q 80 c: Explain Garbage Management Plan ?

Q 80 d: Certificated under this Annex 5? (None)

Q 80 e: Special area under this Annex 5 ?

Q 80 f: How you will come to know that your ship is Following ANNEX 5 ?

A 80, 80 a, 80 b, 80 c, 80 d, 80 e, 80 f:

ANNEX 5

ANNEX 5 : Regulations for the Prevention of Pollution by Garbage from Ships.

APPLY TO: All ships

TOTAL NO OF REGULATION: 9

- Regulation 1 Definitions
- Regulation 2 Application
- Regulation 3 Disposal of garbage outside special areas
- Regulation 4 Special requirements for disposal of garbage
- Regulation 5 Disposal of garbage within special areas
- Regulation 6 Exceptions
- Regulation 7 Reception facilities
- Regulation 8 Port State control on operational requirements
- Regulation 9 Placards, garbage management plans and garbage record keeping

Garbage means: All kinds of victual, domestic and operational waste excluding fresh fish and parts thereof, generated during the normal operation of the ship and liable to be disposed of continuously or periodically except those substances which are defined or listed in other Annexes to the present Convention like Oil, Sludge, Sewage, Noxious liquid substance etc. etc.....

SPECIAL AREA UNDER THIS ANNEX: (Total 8)

- The Mediterranean Sea area
- The Baltic Sea area
- The Black Sea area
- The Red Sea area
- The Gulfs area
- The North Sea area
- The Antarctic area
- The Wider Caribbean Region

NEW DISCHARGE REGULATION APPLY FROM 1st JAN 2013

Type of garbage	Ships outside special areas	Ships within special areas	Offshore platforms (more than 12 nm from land) and all ships within 500 m of such platforms
Food waste comminuted or ground	Discharge permitted ≥ 3 nm from the nearest land, en route and as far as practicable	Discharge permitted ≥ 12 nm from the nearest land, en route and as far as practicable	Discharge permitted
Food waste not comminuted or ground	Discharge permitted ≥ 12 nm from the nearest land, en route and as far as practicable	Discharge prohibited	Discharge prohibited
Cargo residues ¹ not contained in wash water	Discharge permitted ≥ 12 nm from the nearest land, en route and as far as practicable	Discharge prohibited	Discharge prohibited
Cargo residues ¹ contained in wash water		Discharge permitted ≥ 12 nm from the nearest land, en route, as far as practicable and subject to two additional conditions ²	Discharge prohibited
Cleaning agents and additives ¹ contained in cargo hold wash water	Discharge permitted	Discharge permitted ≥ 12 nm from the nearest land, en route, as far as practicable and subject to two additional conditions ²	Discharge prohibited
Cleaning agents and additives ¹ in deck and external surfaces wash water		Discharge permitted	Discharge prohibited
Carcasses of animals carried on board as cargo and which died during the voyage	Discharge permitted as far from the nearest land as possible and en route	Discharge prohibited	Discharge prohibited
All other garbage including plastics, synthetic ropes, fishing gear, plastic garbage bags, incinerator ashes, clinkers, cooking oil, floating dunnage, lining and packing materials, paper, rags, glass, metal, bottles, crockery and similar refuse	Discharge prohibited	Discharge prohibited	Discharge prohibited
Mixed garbage	When garbage is mixed with or contaminated by other substances prohibited from discharge or having different discharge requirements, the more stringent requirements shall apply		

Placards, Garbage Management Plans (GMP) and Garbage Record Book (GRB):

- **Every ship of 12 m or more in length overall shall display placards which notify the crew and passengers of the disposal requirements.**
- **The placards shall be written in the working language of the ship's personnel and, for ships engaged in voyages to ports or offshore terminals under the jurisdiction of other Parties to the Convention, shall also be in English, French or Spanish.**

Garbage Management Plans (GMP):

- **Every ship of 400 tons gross tonnage and above, and every ship which is certified to carry 15 persons or more, shall carry a garbage management plan which the crew shall follow.**
- **This plan shall provide written procedures for collecting, storing, processing and disposing of garbage, including the use of the equipment on board.**
- **It shall also designate the person in charge of carrying out the plan.**
- **Such a plan shall be in accordance with the guidelines developed by the Organization and written in the working language of the crew.**

Garbage Record Book (GRB):

- **Every ship of 400 tons gross tonnage and above and every ship which is certified to carry 15 persons or more shall carry GRB.**
- **Each discharge operation, or completed incineration, shall be recorded in the Garbage Record Book and signed for on the date of the incineration or discharge by the officer in charge.**
- **Each completed page of the Garbage Record Book shall be signed by the master of the ship.**
- **The entries in the Garbage Record Book shall be at least in English, French or Spanish. Where the entries are also made in an official language of the State whose flag the ship is entitled to fly, these entries shall prevail in case of a dispute or discrepancy.**
- **The entry for each incineration or discharge shall include date and time, position of the ship, description of the garbage and the estimated amount incinerated or discharged.**
- **The Garbage Record Book shall be kept on board the ship and in such a place as to be available for inspection in a reasonable time.**
- **This document shall be preserved for a period of two years after the last entry is made on the record.**

Entries in the Garbage Record Book: (main 4 entries)

Entries in the Garbage Record Book shall be made on each of the following occasions:

1. When garbage is discharged into the sea:

- Date and time of discharge
- Position of the ship (latitude and longitude)
- Category of garbage discharged
- Estimated amount discharged for each category in cubic meters
- Signature of the officer in charge of the operation.

2. When garbage is discharged to reception facilities ashore or to other ships:

- Date and time of discharge
- Port or facility, or name of ship
- Category of garbage discharged
- Estimated amount discharged for each category in cubic meters
- Signature of officer in charge of the operation.

3. When garbage is incinerated:

- Date and time of start and stop of incineration
- Position of the ship (latitude and longitude)
- Estimated amount incinerated in cubic meters
- Signature of the officer in charge of the operation.

4. Accidental or other exceptional discharges of garbage

- Time of occurrence
- Port or position of the ship at time of occurrence
- Estimated amount and category of garbage
- Circumstances of disposal, escape or loss, the reason therefor and general remarks.

ANNEX 5 following how we know ?

- First check the New Regulation Garbage Postcard are placed in proper place, like Galley, ECR, Bridge, Ship's office, Mess room ?
 - Garbage drum are properly marked in different color for different type of Garbage.
 - GMP & GRB should be updated.
-

Q 81: Explain ANNEX 6 in detail ? MOST IMPORTANT ANNEX mostly asked by surveyor.

Q 81 a: Explain New Regulation ?

Q 81 b: Explain NO_x and SO_x limitation this days?

Q 81 c: NO_x and SO_x reduction method explain any one?

Q 81 d: EEDI explain ?

Q 81 e: Special Area under this annex ?

A 81, 81 a, 81 b, 81 c, 81 d, 81 e:

ANNEX 6

Annex 6: Regulations for the Prevention of Air Pollution from Ships

APPLY TO: All ship

TOTAL NO OF REGULATION: 19

Chapter I - General

- Regulation 1 Application
- Regulation 2 Definitions
- Regulation 3 General exceptions
- Regulation 4 Equivalents

Chapter II - Survey, certification and means of control

- Regulation 5 Surveys and inspections
- Regulation 6 Issue of International Air Pollution Prevention Certificate
- Regulation 7 Issue of Certificate by another Government
- Regulation 8 Form of Certificate
- Regulation 9 Duration and validity of Certificate
- Regulation 10 Port State control on operational requirements
- Regulation 11 Detection of violation and enforcement

Chapter III - Requirements for control of emissions from ships

- Regulation 12 Ozone-depleting substances
- Regulation 13 Nitrogen oxides (NO_x)
- Regulation 14 Sulphur oxides (SO_x)
- Regulation 15 Volatile organic compounds
- Regulation 16 Shipboard incineration
- Regulation 17 Reception facilities
- Regulation 18 Fuel oil quality
- Regulation 19 Requirements for platforms and drilling rigs

Surveys and inspections:

- Every ship of 400 gross tonnage or above and every fixed and floating drilling rig and other platforms shall be subject to the surveys specified below

(a) an initial survey before the ship is put into service

- This survey shall be such as to ensure that the equipment, systems, fittings, arrangements and material fully comply with the applicable requirements of this Annex;

(b) periodical surveys at intervals specified by the Administration, but not exceeding five years

- which shall be such as to ensure that the equipment, systems, fittings, arrangements and material fully comply with the requirements of this Annex; and

(c) a minimum of one intermediate survey during the period of validity

CERTIFICATE UNDER THIS ANNEX:

- INTERNATIONAL AIR POLLUTION PREVENTION CERTIFICATE (**Valid 5 YEAR**)
- ENGINE INTERNATIONAL AIR POLLUTION PREVENTION CERTIFICATE
- INTERNATIONAL ENERGY EFFICIENCY CERTIFICATE

Ozone-depleting substances

Ozone-depleting substances that may be found on board ship include, but are not limited to:

- Halon 1211 Bromochlorodifluoromethane
- Halon 1301 Bromotrifluoromethane
- Halon 2402 1,2-Dibromo-1,1,2,2-tetrafluoroethane (also known as Halon 114B2)
- CFC-11 Trichlorofluoromethane
- CFC-12 Dichlorodifluoromethane
- CFC-113 1,1,2-Trichloro-1,2,2-trifluoroethane
- CFC-114 1,2-Dichloro-1,1,2,2-tetrafluoroethane
- CFC-115 Chloropentafluoroethane.
- New installations which contain ozone-depleting substances shall be prohibited on all ships, except that new installations containing hydrochlorofluorocarbons (HCFCs) are permitted until 1 January 2020.

Nitrogen oxides (NO_x)

APPLICABLE FOR ONLY ENGINE (M/E, A/E)

- **This regulation shall Apply to:**
 - (i) each diesel engine with a power output of more than 130 kW which is installed on a ship constructed on or after 1 January 2000.
 - (ii) each diesel engine with a power output of more than 130 kW which undergoes a major conversion on or after 1 January 2000.
- **This regulation does NOT Apply to:**
 - (i) emergency diesel engines, engines installed in lifeboats and any device or equipment intended to be used solely in case of emergency.

PURPOSE: To reduce the Air Pollution.

NO_x Formed ?

- Marine fuel in an I.C engine is burnt inside the combustion chamber by the correct mixture of fuel and air in the presence of heat or ignition source.
- The ignition source in the marine engine is the compression stroke of the piston, after which, the combustion begins.
- As the air mixture is 21 % Oxygen and 78% Nitrogen, nitrogen reacts with oxygen under certain engine operating conditions to form Nitrogen oxides or NO_x. (1100⁰ C)

Causes NO_x in Marine Engines

- High Cylinder Temperature and Pressure during combustion process.
- Heavy Load on the engine or engine unit.
- Improper air and fuel ratio for combustion.
- High Temperature of intake or scavenge air inside the cylinder.
- Overheated cylinder jacket due to poor heat transfer by jacket cooler.
- Jacket water temperature is on the higher side.

MEO CLASS 4 SAFETY (COSCPPOOL) ORAL PREPARATION FILE PART 4

REGULATION:

Ship power output 130 KW and ship 400 GT and above shall apply.

TIER=1 from 1st JAN 2000 to 31st DEC 2010

RPM LIMITATION	NO _x LIMITATION
0 – 130	17 gm/kw.hr
130 – 1999	$45 \times n^{-0.2}$ gm/kw.hr
More than 2000	9.8 gm/kw.hr

TIER=2 from 1st JAN 2011 to 31st DEC 2015

RPM LIMITATION	NO _x LIMITATION
0 – 130	14.36 gm/kw.hr
130 – 1999	$44 \times n^{-0.23}$ gm/kw.hr
More than 2000	7.66 gm/kw.hr

TIER=2 AFTER 1st JAN 2016 onward

RPM LIMITATION	NO _x LIMITATION
0 – 130	3.4 gm/kw.hr
130 – 1999	$9 \times n^{-0.23}$ gm/kw.hr
More than 2000	1.96 gm/kw.hr

Where n = rated engine speed
= crankshaft revolution /minute

Reducing NOx emission:

Following are the methods to reduce NOx emission from ship:

Humid Air Method:

- In this method, water vapour is mixed in the combustion air before supplying it to the cylinder.
- Air from the T/C blower is passed through a cell that humidifies and chills the hot air taking moisture from the cooling water until air saturation is achieved.
- Generally sea water is utilized in this method by heating it with jacket water and turbo charger heat, and the left over brine is disposed back to the sea. This method can achieve reduction of NOx by 70-80%.

Exhaust Gas Re circulation (EGR):

- As the name suggests, some amount of engine exhaust gases are send back to the scavenge space to mix up with the air to be supplied to cylinder for combustion.
- This reduces the oxygen content of the air and hence reduces formation of NOx.

Water Injection and Water emulsion:

- In this method, water is added to reduce the temperature of combustion leading to low NOx emission.
- **In water emulsion, fuel is blended with water and in water injection a separate fresh water injector is mounted in the cylinder head which injects water.**
- This method has a drawback of increasing the specific fuel oil combustion with reduction in NOx by 20-45%.

High Scavenge Pressure and Compression Ratio:

- With high scavenge pressure and compression ratio, large amount of air can be introduced inside the cylinder to lower combustion temperature and NOx emission.

Selective Catalytic Reduction(SCR):

- The SCR is the most efficient method to reduce NOx emissions from ships (**up to 90-95% of reduction**).
- In this method, low sulphur fuel oil is used and exhaust temperature is maintained above 300⁰ C.
- The exhaust gas is mixed by water solution of **UREA (CH₄ N₂O)** and then it is passed through catalytic reactor.
- The only disadvantage of SCR is its expansive installation and operating cost.

Two Stage Turbocharger:

- ABB's latest two stage turbocharger can reduce the exhaust temperature in the intercoolers and also the NOx content in the emitted exhaust.

Engine Component Modification:

- It is better to design an engine which has a property to reduce the NOx formation during combustion process rather than investing on expensive secondary measures.
- Integration of slide valve type fuel injector with almost zero sack volume eliminates any chance of fuel dripping and after burning, leading to cylinder temperature and NOx formation..

UPDATING NO_x TECHNICAL FILE:

- Those engines which come under ANNEX-6 installed after 1st JAN 2000 having power output more than 130 KW to be tested & issued with an Engine International Air Pollution Prevention Certificate and approved NO_x technical file.
- The approved file provides details of the allowable engine components settings operating value and allowable adjustment which ensure the engine will continue to operate within the acceptable NO_x emission limits.
- If any adjustment, part replacement and modification are carried out which influences NO_x emission characteristics should be recorded in an engine's record book of engine parameter.
- ID number of all such components used is to be recorded.
- The ID numbers are stamped on these parts and please record them before fitting in to the engine.
- The location of the ID number also mention in NO_x technical file.
- When adjusts are made on FQS (fuel quality setting) or VIT and for operational reasons the limits mentioned in the file which should not exceed.

Following list of the components and setting that influence the NO_x emission.

- **Fuel injection timing.**
- **Fuel pump/ cam**
- **Fuel injection nozzle modification.**
- **Exhaust cam adjustment**
- **Cylinder cover/ liner replace.**
- **Piston crown replace**
- **T/C compressor or turbine side changes**
- **Scavenge air cooler maintain.**
- **Governor setting changed**
- So by keep updating all detail whose engine 130 KW or more and built after 1st JAN 2000.

Sulphur oxides (SO_x)

APPLICABLE FOR BOTH ENGINE (M/E, A/E) AND BOILER, INCINERATOR

SO_x Formed?

- Bad quality of Fuel.
- High percentage of Sulphur in Fuel during bunkering.

Causes and Effects of SOx Emission:

- The sulphur oxides emission is due to the presence of sulphur compound in the marine fuels used in marine engines on board vessel.
- Better the grade, lower will be the sulphur content as it is removed by refining of the fuel.
- The smoke containing sulphur oxides emitted by the combustion of marine fuel will further oxidise and in presence of catalyst like NO₂, will form sulphuric acid which is a major cause of acid rain.
- It has also been recognised that the emission of SO_x contributes in formation of secondary inorganic aerosol gases, fine particles which are harmful to humans.
- Maritime industry consumes mostly low grade of fuel oil i.e. heavy oil and diesel oil with high sulphur content as compared to any other transportation medium.
- But due to MARPOL Annex VI stringent norms, marine engines are now using better grade of marine fuel like marine gas oil.

REGULATION:

OUTSIDE SPECIAL AREA (SECA):

- Before 1st JAN 2012 = 4.5 % sulphur m/m
- After 1st JAN 2012 = 3.5 % sulphur m/m
- After 1st JAN 2020 = 0.5 % sulphur m/m

on JAN 2018 international survey carried out for 0.5 % and if it will not satisfied than it will extend JAN 2025.

INSIDE SPECIAL AREA (SECA)

- Before 1st JULY 2010 = 1.5 % sulphur m/m
- After 1st JULY 2010 = 1.0 % sulphur m/m
- After 1st JAN 2015 = 0.10 % sulphur m/m

Reducing SOx Emission

SO_x or sulphur oxides are formed during combustion process in the engine because of presence of sulphur content in the fuel.

Following are the methods and technologies used to reduce sulphur emission from marine engines.

Use of Low sulphur fuel oil:

- It is expensive but most commonly used method to comply with Annex VI of MARPOL while entering emission controlled Area or ECA.

Exhaust Gas Scrubber Technology:

- The exhaust gas from the engine is passed through the scrubber tower where a liquid is showered over it. Fresh water blended with caustic soda (NaOH) is used as a scrubbing liquid which reduces the SO_x to 95%.

- The scrubbing water is then sent to a water treatment effluent emulsion breaking plant after which it can be discharged overboard.

Cylinder Lubrication:

- Good quality cylinder lubrication along with efficient control systems such as Pulse or Alpha lubrication systems can neutralise the sulphur in the fuel and reduce SO_x emissions from the engine.

Note:

- *NO_x is not applicable for Boiler and Incinerator becoz the temperature & pressure required to make NO_x are not achieved in Boiler & Incinerator.*
- *More important the resistance time for the fuel to react with air is very less in boiler or incinerator.*

Energy Efficiency Design Index (EEDI)

- In terms of Co₂ emissions per tonne of cargo, shipping is the most efficient form of commercial transport.
- But due to the sheer scale of the industry, shipping contributes to about 3% of the world's emissions, which is 0.9 billion tonnes in 2010.
- To top it all, popular studies indicate that the emission rate is to increase by 75% in the next 15 years due to demand and growth in global trade. Needless to point out, this has exerted a lot of pressure by the international community on the IMO to increase restrictions on the shipping industry.
- To quote the opinion of the International Chamber of Shipping on this issue, "The consensus of opinion within the global industry is that it may be possible for shipping to reduce CO₂ emitted per tonne of cargo transported one kilometer (tonne/km) by perhaps 15%-20% between 2007 and 2020, through a combination of technological and operational developments, as well as the introduction of new and bigger ships, designed to the new IMO Energy Efficiency Design Index."
- As a result of such international consensus, the member states of IMO have agreed on certain key principles on development on regulations from ships so that they will effectively reduce CO₂ emissions, be cost effective and at the same time be based on sustainable development without restricting trade and growth. **Thus came into being the EEDI developed by IMO.**
- The means proposed to reduce CO₂ – EEDI
- **The empirical formula for the EEDI is as follows:**

EEDI = (Power · Specific Consumption · Carbon Conversion) / (Capacity · Speed)

- This essentially translates into (number of grams of CO₂ emissions) per tonne per nautical mile.

EEDI Conclusion

- The EEDI is essentially a measure of efficiency of ships in transportation, such that maximum cargo carried with minimal fuel consumption and therefore minimal CO₂ emissions will give a vessel a good index.
- What the EEDI predominantly emphasizes upon is to enforce power limits for new ships, thus reducing their operational speeds and reduce carbon emissions. Hence this may necessitate the reduction in speed for bulkers and tankers in the near future.

Shipboard incineration:

- Each incinerator shall be approved by the Administration taking into account the standard specifications for shipboard incinerators developed by the Organization.

Shipboard incineration of the following substances shall be prohibited:

- Annex I, II and III cargo residues of the present Convention and related contaminated packing materials.
- Polychlorinated biphenyls (PCBs)
- Garbage, as defined in Annex V of the present Convention, containing more than traces of heavy metals.
- Refined petroleum products containing halogen compounds.
- Shipboard incineration of sewage sludge and sludge oil generated during the normal operation of a ship may also take place in the main or auxiliary power plant or boilers, but in those cases, shall not take place inside ports, harbours and estuaries.
- Shipboard incineration of polyvinyl chlorides (PVCs) shall be prohibited, except in shipboard incinerators for which IMO Type Approval Certificates have been issued.
- Monitoring of combustion flue gas outlet temperature shall be required at all times and waste shall not be fed into a continuous-feed shipboard incinerator when the temperature is below the minimum allowed temperature of 850⁰ C.
- For batch-loaded shipboard incinerators, the unit shall be designed so that the temperature in the combustion chamber shall reach 600⁰ C within 5 minutes after start-up.

BUNKER DELIVERY NOTE: (Annex 6, Regulation 18)

- The bunker delivery note shall be kept on board the ship in such a place as to be readily available for inspection at all reasonable times.
- **It shall be retained for a period of 3 years after the fuel oil has been delivered on board.**
- The bunker delivery note shall be accompanied by a representative sample of the fuel oil delivered, taking into account guidelines to be developed by the Organization.
- **The sample is to be sealed and signed by the supplier's representative and the master or officer in charge of the bunker operation on completion of bunkering operations and retained under the ship's control until the fuel oil is substantially consumed, but in any case for a period of not less than 12 months from the time of delivery.**
- **4 SAMPLE FOR:**
 - LAB
 - MARPOL
 - SHIP
 - SUPPLIER

BDN ENTRIES:

- Vessel name
- IMO number
- Name of PORT
- Name of Barge
- Position of Vessel
- GT of vessel
- Product name or Grade
- Date of Delivery
- Time of Start and Stop bunker
- Viscosity @ 50⁰ c CST
- Sulphur content % m/m **(m/m means: 1 ltr of Sulphur in 100 ltr of Fuel)**
- Flash Point ⁰ C
- Density @ 15⁰ C kg/m³
- Pour Point ⁰ C
- Quantity taken @ 35⁰ C in m³

SPECIAL AREA UNDER THIS ANNEX 6:

- The Baltic sea area (SECA)
- The North sea area (SECA)
- The North American area (ECA)
- The United states Caribbean area (ECA)

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Q 82: How many major certificate we need to carry ?

A 82:

Here you have the certificate which in my Container ship, and as far as I know in most of the type of ship have 95 % same certificate and here I also note down some important document also so don't be confuse about certificate and document.

UNDER SOLAS 74 CERTIFICATE ONLY (Total 9)
1) CARGO SHIP SAFETY CONSTRUCTION CERTIFICATE
2) CARGO SHIP SAFETY EQUIPMENT CERTIFICATE
3) CARGO SHIP SAFETY RADIO CERTIFICATE
4) CARGO SHIP SAFETY CERTIFICATE
5) MINIMUM SAFE MANNING CERTIFICATE
6) INTERNATIONAL SAFETY MANAGEMENT CERTIFICATE
7) SAFETY MANAGEMENT CERTIFICATE
8) DOCUMENT OF COMPLIANCE
9) INTERNATIONAL SHIP SECURITY CERTIFICATE
PLANS AND DOCUMENT ONLY (Total 21)
1) Emergency towing procedure
2) Ship Security Plan (SSP)
3) Deck log book
4) Intact stability booklet
5) Damage Control Plan
6) Damage Control Booklet
7) Maneuvering Information
8) Maintenance plan/program
9) Training manual
10) Fire control and Safety plan
11) Fire safety operational booklet
12) Muster list
13) Training manual for Life saving appliance
14) Material Safety Data Sheets MSDS
15) Radio record

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16) Voyage Data Recorder system- certificate of compliance
17) International code of signal IAMSAR manual
18) Cargo securing manual
19) Dangerous Goods Manifest or Stowage plan
20) Shipboard Emergency plan
21) Continuous synopsis record
UNDER MARPOL 73/78 ANNEX-1 CERTIFICATE ONLY
1) INTERNATIONAL OIL POLLUTION PREVENTION CERTIFICATE (IOPP)
DOCUMENT ONLY IN ANNEX 1
1) Oil Record Book part 1 & 2
2) Shipboard Oil pollution emergency plan (SOPEP)
3) Oil discharge monitoring and control system manual
UNDER MARPOL 73/78 ANNEX-2 CERTIFICATE ONLY
1) INTERNATIONAL POLLUTION PREVENTION CERTIFICATE FOR THE CARRIAGE OF NOXIOUS LIQUID SUBSTANCE IN BULK
2) CERTIFICATE OF FITNESS
DOCUMENT ONLY IN ANNEX 2
1) Procedure and arrangement manualp&A manual
2) Cargo record book
3) Shipboard marine pollution emergency plan for Noxious Liquid Substance
UNDER MARPOL 73/78 ANNEX-3 CERTIFICATE ONLY
NONE
DOCUMENT ONLY IN ANNEX 3
1) Detailed stowage plan
2) IMDG code book
UNDER MARPOL 73/78 ANNEX-4
1) INTERNATIONAL SEWAGE POLLUTION PREVENTION CERTIFICATE (ISPP)
DOCUMENT ONLY IN ANNEX 4
1) VOC management plan
UNDER MARPOL 73/78 ANNEX-5 CERTIFICATE ONLY
NONE

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DOCUMENT ONLY IN ANNEX 5
1) Garbage management plan applicable 1 st January 2013
2) Garbage record book applicable 1 st January 2013
UNDER MARPOL 73/78 ANNEX -6 CERTIFICATE ONLY
1) INTERNATIONAL AIR POLLUTION PREVENTION CERTIFICATE
2) ENGINE INTERNATIONAL AIR POLLUTION PREVENTION CERTIFICATE
3) INTERNATIONAL ENERGY EFFICIENCY CERTIFICATE
DOCUMENT ONLY IN ANNEX 6
1) List of equipment containing Ozone depleting substance
2) Fuel oil change over procedure and logbook
3) Operating manual for incinerator
4) Bunker delivery note
5) Ship energy efficiency management plan (SEEMP)
6) NO _x Technical file
UNDER LOAD LINE 1966 CERTIFICATE ONLY
1) INTERNATIONAL LOAD LINE CERTIFICATE
UNDER INTERNATIONAL TONNAGE CONVENTION 69 CERTIFICATE
1) INTERNATIONAL TONNAGE CERTIFICATE
UNDER STCW 1978/95 CERTIFICATE ONLY
1) CERTIFICATE FOR MASTER, OFFICER AND RATING
2) RECORD OF HOUR REST CERTIFICATE
UNDER ILO CONVENTION CERTIFICATE ONLY
1) MARITIME LABOUR CERTIFICATE
2) MEDICAL CERTIFICATE FOR ILO 73
UNDER LIABILITY CONVENTION CERTIFICATE ONLY
1) CERTIFICATE OF REGISTRY

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Registry		
Certificate of Registry	Indefinitely Valid	
Statutory		
International Load Line	5 Years	All Ships.Required Under LOadline convention. Subject to Annual Endorsement. International Load Line Exemption Certificate must be carried were exemptions under Loadline 1988 protocol applies
IOPP	5 Years	All tankers above 150GRT and all other ships above 400GRT. Required under MARPOL 73/78. Subject to Annual and intermediate Endorsements. The certificate is supplemented by a Record of Construction and Equipment for ships other than Oil Tankers (Form A) or a Record of Construction for Oil Tankers (Form B)
Cargo Ship Safety Construction Certificate	5 Years	All Cargo ships over 500GRT.SOLAS Requirement. Supplemented by Record of Construction and Equipment. Subject to Annual and intermediate Endorsements
Pasenger Ships Safety Certificate	1 Year	All Passenger vessels. SOLAS Requirement. Supplemented by Record of Equipment. Associated to this may be an Exemption Certificate, Special Trade Passenger Ship Certificate , Special Trade Passenger Ships Space Certificate as well as Search and Rescue Co-operation plan, List of operational limitations and Decision Support System for Masters
Cargo Ship Safety Equipment certificate	2 Years	All Cargo ships over 500GRT. Supplemented by Record of Equipment. Subject to Annual and intermediate Endorsements
Safety Radio Certificate	1 Year	SOLAS Requirement. All Cargo ships over 300GRT.
Dangerous Goods Manifest	per Voyage	SOLAS/MARPOL. Any vessel carrying dangerous goods.
Documentation of authorisation for Carriage of Grain	Indefinitely Valid	Issued to every vessel loaded in accordance with International Code for the Safe Carriage of Grain in Bulk
Document of Compliance for Ships Carrying Dangerous Goods	5 Years	SOLAS.Document giving evidence that construction and equipment is appropriate to goods carried.
Noxious Liquid Substances	5 Years	Subject to Annual and intermediate Endorsements.MARPOL.
SOPEP Manual	Approved by administration	MARPOL. Every oil tanker over 150GRT and every ship over 400GRT
US Coast Guard Letter of Compliance	2 Years	Annual Inspections
ISM		
Document of Compliance	5 Years	Subject to Annual and intermediate

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		Endorsements.SOLAS
Safety management Certificate	5 Years	Subject to intermediate survey
Marine management Agreement		
Class		
Cargo Securing Manual		Class Approved. All Ships carrying carogs other than solid and liquid bulk .SOLAS.
Class Automation	5 Years	
Classification Certificate:	5 Years	Subject to Annual, intermediate , Continuous (CSH) and Special Surveys
Classification Certificate:Hull	5 Years	Subject to Annual, intermediate , Continuous (CSH) and Special Surveys
Classification Certificate:Machinery	5 Years	Subject to Annual, intermediate , Continuous (CSM) and Special Surveys
Classification Certificate:Refrigeration	5 Years	Subject to Annual, intermediate , Continuous and Special Surveys
Dry-Docking	5 Years	Intermediate to be held between 2nd and 3rd anniversary dates.
In- Water Surveys		Special case survey which may replace intermediate docking under certain circumstances
Exhaust Gas Boiler	5 Years	Intermediate to be held between 2nd and 3rd anniversary dates.
Inert gas Plant	5 Years	
Oil Fired Boiler	5 Years	Intermediate to be held between 2nd and 3rd anniversary dates.
TailShaft	5 Years	
Hull Thickness Measurements	5 Years	Special surveys 1st to 5th Special surveys
Documents		
Intact Stability		Every passenger ship and every cargo ship over 24m.
Damage Control Booklets		For all pasenger and Cargo Ships. Plans showing watertight boundaries, compartments etc
Minimum Safe manning Document		
Certificates for Masters, Officers and Ratings		STCW 95
Oil Record Book		Every Oil Tanker over 150GRT and every ship over 400GRT must have Part 1, Oil tankers over 150GRT must have part 2
Garbage management Plan		Every ship over 400GRT and every ship carrying 15 persons
Garbage Record Book		Every ship over 400GRT and every ship carrying 15 persons
Document of Compliance with the requirements for ships carrying dangerous goods		A suitable document giving evidence of construction and design
Certificate of Insurance or other financial security in respect of civil		Each ship carrying 2000tons or more of oil in bulk

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liability for oil pollution damage		
Enhanced Survey Report File		Bulkers and tankers
Record of Oil Discharge Monitoring and control system for last balast voyage		MARPOL Requirement. Record of oil content in any continuous discharge
Bulk Carrier Booklet		To prevent over stressing of hull
Cargo Record Book		Every ship to which Annex II applies of MARPOL,
International Pollution Prevention Certificate for the Carriage of Noxious iquid Substances in Bulk		Including certificates under Bulk Chemical Code
Proceedures and Arrangements Manual		Evry ship certified to carry Noxious liquid substances in bulk
Certificate of Fitness for the Carriage of dangerous chemicals in Buk		Mandatory under Annex II
Certificate of Fitness to carry Liquid Gasses in Bulk		

Adoption, entry into force & date of taking effect of Special Areas			
Special Areas	Adopted	Date of Entry into Force	In Effect From
Annex I: Oil			
Mediterranean Sea	2 Nov 1973	2 Oct 1983	2 Oct 1983
Baltic Sea	2 Nov 1973	2 Oct 1983	2 Oct 1983
Black Sea	2 Nov 1973	2 Oct 1983	2 Oct 1983
Red Sea	2 Nov 1973	2 Oct 1983	
"Gulfs" area	2 Nov 1973	2 Oct 1983	1 Aug 2008
Gulf of Aden	1 Dec 1987	1 Apr 1989	
Antarctic area	16 Nov 1990	17 Mar 1992	17 Mar 1992
North West European Waters	25 Sept 1997	1 Feb 1999	1 Aug 1999
Oman area of the Arabian Sea	15 Oct 2004	1 Jan 2007	
Southern South African waters	13 Oct 2006	1 Mar 2008	1 Aug 2008
Annex II: Noxious Liquid Substances			
Antarctic area	30 Oct 1992	1 Jul 1994	1 Jul 1994
Annex IV: Sewage			
Baltic Sea	15 Jul 2011	1 Jan 2013	
Annex V: Garbage			
Mediterranean Sea	2 Nov 1973	31 Dec 1988	1 May 2009

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Baltic Sea	2 Nov 1973	31 Dec 1988	1 Oct 1989
Black Sea	2 Nov 1973	31 Dec 1988	
Red Sea	2 Nov 1973	31 Dec 1988	
"Gulfs" area	2 Nov 1973	31 Dec 1988	1 Aug 2008
North Sea	17 Oct 1989	18 Feb 1991	18 Feb 1991
Antarctic area (south of latitude 60 degrees south)	16 Nov 1990	17 Mar 1992	17 Mar 1992
Wider Caribbean region including the Gulf of Mexico and the Caribbean Sea	4 Jul 1991	4 Apr 1993	1 May 2011
Annex VI: Prevention of air pollution by ships (Emission Control Areas)			
Baltic Sea (SOx)	26 Sept 1997	19 May 2005	19 May 2006
North Sea (SOx)	22 Jul 2005	22 Nov 2006	22 Nov 2007
North American (SOx, and NOx)	26 Mar 2010	1 Aug 2011	1 Aug 2012
United States Caribbean Sea ECA (SOx, NOx and PM)	26 Jul 2011	1 Jan 2013	1 Jan 2014

Q 83: What was you doing on Saturday on your ship?

A 83:

Checks in Saturday Planned Maintenance Routine

1. Fire Detection System [Electrical officer] - (EVERY SATURDAY)
2. CO2 Bottles and System [Electrical officer] - (MONTHLY)
3. Air and Foam Equipment [Second Engineer] - (EVERY SATURDAY)
4. General Alarm System [Electrical officer] - (EVERY SATURDAY)
5. Emergency Batteries [Electrical officer] - (FORTNIGHTLY)
6. Funnel Flaps [Fourth Engineer] - (EVERY SATURDAY)
7. Emergency /Remote stops [Electrical officer & Second engineer] - (MONTHLY)
(M/E QCV, E/R Blower,E/R pump,Accommodation Blower)
8. Emergency Lighting [Electrical officer] - (FORTNIGHTLY)
9. Life Boat Engine [Third Engineer]- (EVERY SATURDAY)
10. Emergency Fire Pump [Fourth Engineer] - (EVERY SATURDAY)
11. Emergency Air Compressor [Fourth Engineer] - (EVERY SATURDAY)
12. Emergency Steering gear [Second Engineer] - (FORTNIGHTLY)
13. Emergency Bilge suction valve [Fourth Engineer] - (MONTHLY)
14. Normally valves which are not in use [Second Engineer] - (MONTHLY)

(Ship side valve, sewage plant, isolating valve)

15. Portable Electronic tools And Equipment [Electrical officer] - (MONTHLY)
 16. Main Engine Safety Devices [Electrical officer & Second engineer] - (MONTHLY)
 17. Auxiliary Engines Safety [Electrical officer & Fourth engineer] - (MONTHLY)
 18. Oily Water Separator & 15 ppm indicator [Electrical officer] - (EVERY SATURDAY)
 19. Main Engine Maneuvering. [Electrical officer & Second engineer] - (MONTHLY)
 20. Cargo Gear all limit switches. [Electrical officer] - (MONTHLY)
 21. Boiler Safety Valve [Electrical officer & Third engineer] - (MONTHLY)
 22. Freezer room alarm, hospital room alarm, bilge alarm, incinerator room alarm and steering gear alarm [Electrical officer] - (MONTHLY)
- =====

Q 84: Dry docking procedure?

A 84:

Dry Docking Preparation

(a) A few months before

- 1) Information about The dry docking (estimated time and duration) to be taken from C/E
- 2) Preliminary repair list must be collected and arranged by instruction of C/E.
- 3) Repair work to be divided into two categories; one for dockyard and other for the ship's staff. The repair list must contain the followings
 - a. Nos. of sea suction chests and grids and their size
 - b. Nos. of sea suction valve and their sizes.
 - c. Nos. of ship side discharge valve and their size.
 - d. Nos. of scupper valve and their sizes.
 - e. Nos. of piping to be repaired including their length, inside/out side diameter, bends, no. of flange and their P.C.D [including detail drawing]
 - f. No. of engine room valves to be renewed or repaired and their specifications.
 - g. Main engine overhauling preparation (1) Spare (2) tools (3) measurement (4) instruction manuals.
 - h. Auxiliary engine, boiler, pump & other machinery preparation for overhauling.
- 4) Exact location of items to be repaired or overhaul must be marked with tag label according to repair code.
- 5) Tools and spares, stores should be checked and prepared for use.
- 6) Store and spare requisition which will be repaired to use during docking periods must be ordered.
- 7) All tools must be marked with paints to prevent mixing with shipyard's one.
- 8) Organization of E/R staff ie. Safety purpose, assign works.

- 9) Distribute work assignments among engine room staff in group by group.
- 10) Maker's instruction on manuals and all drawing must be kept ready for prompt work.

(b) A few days before

- 1) Ballasting and transferring carried out in corporation with chief officer to achieve required trim and draught.
- 2) Engine room bilge well and tank top to be cleaned thoroughly.
- 3) All tank sounding to be taken and account.
- 4) All portable fire extinguishers to be ready at required place.
- 5) Fire fighting fixed installation to be kept ready at required by shipyard's rule.
- 6) Emergency generator, emergency fire pump, emergency air bottle, emergency air compressor must be kept in good condition.
- 7) Shore cooling sea water supply for refrigeration and air condition plant must be ready to receive.
- 8) Shore electrical supply (at entry of dock) Phase, Hz, V, AC or DC.
- 9) Main engine crank shaft deflection to be taken and recorded.

(c) Before a few hour

- 1) Boiler should be shut down and release all steam pressure by using easing gear.
- 2) An instruction to give all engine room personnel that smoking is prohibited in engine room at ship is still in dock.
- 3) Main air bottle, emergency air bottle pressed up to full and close tightly.
- 4) Ready to stop ship generator as soon as vessel enter dry dock and to be kept an electrical officer stand by on shore connection box when shore power is taken.
- 5) Settling and service tank top up, after topping up sounding of all tanks must be taken and recorded.
- 6) Remind all engine room personnel their duty and ready for emergency use.

(d) On dock

- 1) Repair work to be divided into two categories, one for ship staff and other for dry dock.
- 2) Tool and spare must be checked and prepared for use.
- 3) Take daily record of work done by ship staff and dry dock workers.
- 4) Negotiate with in charge of dock yard about work sequence and show him location of item to be repaired.
- 5) At the end of every day, feed back condition of work to C/E.
- 6) Examine all work done by dry dock and engine crew. If unsatisfactory condition was found, inform to C/E and dock yard in charge.

- 7) All engine room personal should be instructed to use store and spare thoroughly and without wasting.
- 8) Bottom survey carried out together with class surveyor, master & C/O.
- 9) Assist class surveyor visit and his subsequent survey.
 - a. Supervise when at sea cannot overhaul works.
 - b. At witness for docking survey item.
 - c. Supervise the docking repair item.
 - d. Measure stern tube wear down, rudder wear down and jumping clearance.
 - e. Propeller check cavitation, corrosion and any damage (Crack, deformation)

After Dry Docking

- 1) Price Negotiate (Man/power, material /repair list)
- 2) Dock charge damage claim
- 3) Report
- 4) Closely check sea valves
- 5) Performance of repaired machinery
- 6) Took M/E crankshaft deflection.

=====

Q 85: Describe precautions to be taken and procedures while receiving bunkers and oil transfers on board?

A 85:

Precautions and procedures to be taken before receiving Bunkers:

- Before bunkering starts all deck scuppers to be plugged. Any water accumulation on deck is to be drained off and plugs are replaced only if local regulation allow.
- Attention to be paid to pipeline tension due to incorrect mooring or tidal effects.
- Bunker hoses are to be checked for damage.
- Bunker hoses are not to be bent into tight bends resulting in high stress.
- Accidental spillage is to be cleaned up and disposed of ashore or to bunker tanks.
- Communication and emergency shutdown signals between ship/shore are to be checked and fully understand.
- Tank vent pipes are to be checked to ensure free escape of gasses.

- Internal oil transfer is to be stopped completely and unnecessary valves to be shut down.
- Firefighting, pollution preventing equipment and oil spill dispersant are to be ready for immediate use.
- Day/night signal is to be exhibited clearly.

Precautions and procedures to be taken during oil transfers on board:

- Bunker tanks change over should be known to all engineers and Master.
- Avoid bunker tanks changing in bad weather/coastal navigation/ports
- Initial transfer/ first transfer, when changed over the tank ,5-10 minutes transfer should be done to other bunker tank(s) or overflow tank and confirm that no sludge or water in the oil prior shifting to settling tank.
- After transfer to settling tank- verify through drain cock that no sludge oil water transferred.
- Check the purifier condition for and operation is correct.
- Purifiers can also pump water into service tanks - during bad weather malfunctioning.
- If diesel oils directly pumped to service tanks - be more careful during the transfer.
- Please inform to all Engineers & Master that tank changeover is successful after verifying the settling and service tanks drains, purifier operations and filters.
- NEVER Change the tanks during maneuvering conditions.

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Q 86: Define Conditions of Assignment of Freeboard?

A 86:

Conditions of Assignment of Freeboard

A. The construction of the ship:

- must be such that her general structural strength will be sufficient for the freeboards to be assigned.
- The design and construction of the ship must be such that her stability in all probable loading conditions is sufficient for the freeboards assigned. Stability criteria are given in the Convention.

B. Superstructure End Bulkheads:

- The heights of the sills of openings at the ends of enclosed superstructures should be at least 380 mm above the deck.

C. Hatchways closed by Portable Covers with Tarpaulins

- The coamings should be of substantial construction with a height above deck of at least 600 mm on exposed freeboard and RQD and on exposed superstructure decks within $\frac{1}{4}$ of the ship's length from FP and at least 450 mm on exposed superstructure decks outside $\frac{1}{4}$ of the ship's length from FP.
- The width of bearing surface for the covers should be at least 65mm.
- Where covers are of wood the thickness should be at least 60 mm with a span of not more than 1.5m. For mild steel portable covers, the strength is calculated with assumed loads.

D. Hatchways closed by Weather tight Steel Covers Coaming heights

- are as for those hatchways with portable beam covers.
- This height may be reduced or omitted altogether on condition that the Administration is satisfied that the safety of the ship is not thereby impaired.
- Mild steel covers should have their strength calculated assuming the loads given previously. The product of the maximum stress thus calculated and the factor of 4.25 should not exceed the minimum ultimate strength of the material, and deflections are limited to not more than 0.0028 times the span under these loads.
- Mild steel plating forming the tops of the covers should not be less in thickness than 1 per cent of the spacing of stiffeners or 6 mm if that is greater.

E. Machinery Space Openings

- These are to be properly framed and efficiently enclosed by steel casings of ample strength. Where casings are not protected by other structures their strength is to be specially considered. Steel doors to be fitted for access should have the sills at least 600mm above the deck

F. Ventilators

- Should have steel coamings and where they exceed 900 mm in height they should be specially supported.
- Ventilator coamings should be of height 900 mm above deck, and in 760 mm above deck. Vent openings should be provided with efficient weather tight closing appliances except in the case of coamings exceeding 4.5m in height and 2.3m in height above deck.

G. Air Pipes

- Exposed parts of pipe shall be of substantial construction.
- The height from the deck should be at least 760 mm on the freeboard deck, and 450 mm on superstructure decks. A lower height may be approved if these heights interfere with working arrangements.
- Permanently attached means of closing the pipe openings should be provided.

H. Cargo Ports and Other Similar Side Openings Below the freeboard deck

- to be fitted with watertight doors to ensure the ship's structural integrity.
- Unless permitted by the Administration the lower edge of such openings should not be below a line drawn parallel to the freeboard deck at side, which has at its lowest point the upper edge of the uppermost load line.

I. Scuppers, Inlets, and Discharges

- Discharges led through the shell either from spaces below the freeboard deck or from within superstructures and deckhouses on the freeboard deck fitted with weathertight doors should be fitted with efficient and accessible means for preventing water from passing inboard.
- Normally this should be an automatic non-return valve with means of closing provided above the freeboard deck.
- Where the vertical distance from the summer water-line to the inboard end of the discharge pipe exceeds 0.02L the discharge may have two automatic non return valves without positive means of closing, provided the inboard valve is always accessible.
- Where the distance exceeds 0.02L a single automatic non-return valve without positive means of closing may be accepted.
- In manned machinery spaces, main and auxiliary sea inlets and discharges in connection with the operation of machinery may be controlled locally.
- Scuppers and discharge pipes originating at any level and penetrating the shell either more than 450mm below the freeboard deck or less than 600mm above the summer water-line should be fitted with an automatic non-return valve.
- Scuppers leading from superstructures or deckhouses not fitted with weathertight doors should be led overboard.

J. Side Scuttles Below the freeboard deck or within the enclosed superstructures

- side scuttles should be fitted with efficient hinged, water-tight, inside deadlights. No side scuttle should be fitted with its sill below a line drawn parallel to the freeboard deck at side and having

its lowest point 2.5 per cent of the ship's breadth above the summer water-line or 500mm whichever is the greater distance.

K. Freeing Ports

- The minimum freeing port area on each side of the ship where sheer in way of the well is standard or greater than standard, is given, in square metres, by:
- $A=0.7+0.035l$ where l is the length of bulwark in the well and is less than 20m and $A=0.07l$ where l is greater than 20 m.
- In no case need l be greater than $0.7L$. If the bulwark is greater than 1.2m in height A is increased by 0.004 sq. m/m of length of well for each 0.1m difference in height.
- If the bulwark is less than 0.9m in height, A is reduced by 0.004 sq.m/m of length of well for each 0.1m difference in height.
- Where there is no sheer A is increased by 50 per cent and with less than standard sheer the per cent increase is obtained by interpolation.
- The lower edges of freeing ports should be as near the deck as practicable.
- Two-thirds of the freeing port area is required to be provided in the half of the well nearest the lowest point of the sheer curve, where the deck has sheer.
- Openings in the bulwarks are protected by bars spaced approximately 230mm apart.
- If shutters are fitted, these should be prevented from jamming.

L. Protection of Crew

- Efficient guard-rails or bulwarks of minimum height 1 metre are to be fitted on all exposed parts of freeboard and superstructure decks.
 - A lower rail may be permitted by the Administration.
 - The maximum vertical spacing between deck and lower rail is 230 mm, and between other rails is 380mm.
 - Satisfactory means should be provided for protection of crew in getting to and from their quarters and other parts used in the working of the ship.
- =====

Q 87: Why Oil tanker have less Freeboard ?

A 87:

There are few reason:

- Oil tanker have less opening as compared to other ships and those opening can be closed efficiently.
 - Oil tankers have lesser area of hatch opening compared to bulk and container.
 - So the structural strength is more and safer, hence allow less freeboard.
 - It has greater sub-division by transverse and longitudinal B/H.
 - Permeability for an oil filled tank is only about 5 % compared to permeability of a grain cargo hold of 60 -65 %, so ingress of water in a bilge compartment will be less.
 - Density of cargo oil less than grain cargo
 - Much larger and better pumping arrangement on tanker to control any bilge water.
- =====

Q 88: Safety on O₂ and Acetylene bottle ?

A 88:

- Flash back arrestor
 - Color coding
 - O₂ bottle are right handed thread
 - Acetylene bottle have left handed thread.
 - Both bottle kept in separate room.
- =====

Q 89: When Tonnage convention adopted?

Q 89 a: What is GT and NT? Explain formula?

A 89, 89 a:

International Convention on Tonnage Measurement of Ships 1969

- An International Conference on Tonnage Measurement was convened by IMO in 1969 with the intention of producing a universally acceptable system of tonnage measurement.
- The International Convention on Tonnage Measurement of Ships 1969 was prepared at this conference and this convention came into force on the 8th July, 1982.
- All ships constructed on or after that date were measured for tonnage in accordance with the 1969 Convention.
- Ships built prior to that date were if the owner so desired permitted to retain their existing tonnages for a period of 12 years from that date, i.e. all ships are required to be measured in accordance with the 1969 Convention by 18th July, 1994.

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GROSS TONNAGE: The Gross Tonnage is found by adding to the Under deck Tonnage, the tonnage of all enclosed spaces between the upper deck and the second deck, the tonnage of all enclosed spaces above the upper deck together with any portion of hatchways exceeding 4% of the gross tonnage.

The gross tonnage (GT) is determined by the following formula:

$$GT = K_1 V$$

where

$$K_1 = 0.2 + 0.02 \log_{10} V$$

V = total volume of all enclosed spaces in cubic meters.

NET TONNAGE: The Net Tonnage or Register Tonnage is obtained by deducting from the Gross Tonnage, the tonnage of spaces which are required for the safe working of the ship:

- (a) master's accommodation
- (b) crew accommodation and an allowance for provision Stores
- (c) wheelhouse, chartroom, radio room and navigation aids room
- (d) chain locker, steering gear space, anchor gear and capstan space
- (e) space for safety equipment and batteries
- (f) workshops and storerooms for pump men, electrician's, carpenter, boatswains and the lamp room
- (g) donkey engine and donkey boiler space if outside the engine room
- (h) pump room if outside the engine room
 - (i) in sailing ships, the storage space required for the sails, with an upper limit of 24% of the gross tonnage
 - (j) water ballast spaces if used only for that purpose. The total deduction for water ballast, including double bottom spaces, may not exceed 19% of the gross tonnage

The net tonnage (NT) is determined by the following formula:

For passenger ships (i.e. ships carrying 13 passengers or more)

$$NT = K_2 V_c \left(\frac{4d}{3D} \right)^2 + K_3 \left(N_1 + \frac{N_2}{10} \right)$$

For other ships:

$$NT = K_2 V_c \left(\frac{4d}{3D} \right)^2$$

where

V_c = total volume of cargo spaces in cubic metres.

d = moulded draft amidships in metres (summer load line draft or deepest subdivision load line in case of passenger ships).

D = moulded depth in metres amidships.

MEO CLASS 4 SAFETY (COSCPPOOL) ORAL PREPARATION FILE PART 4

$$K_2 = 0.2 + 0.02 \log_{10} V_c$$

$$K_3 = 1.25(GT + 10\,000) / 10\,000$$

N_1 = number of passengers in cabins with not more than 8 berths.

N_2 = number of other passengers.

$N_1 + N_2$ = total number of passengers the ship is permitted to carry.

- The factor $\left(\frac{4d}{3D}\right)^2$ is not taken to be greater than unity.
-
- The term $K_2 V_c \left(\frac{4d}{3D}\right)^2$ is not to be taken as less than 0.25 GT; and
- NT is not to be taken as less than 0.30 GT.
- It will be noted that vessels with high freeboards, i.e. low draft to depth (d/D) ratios will have low net tonnages.
- Squaring this ratio can result in excessively low net tonnages hence the limiting value of 0.30 GT.

Q 90: Draw LOAD LINE of your ship?

Q 90 a: Why it is on both side of ship?

Q 90 b: What you mean by TF, F, T, S, W, WNA and circle in load line dia?

Q 90 c: When Load line convention was adopted ?

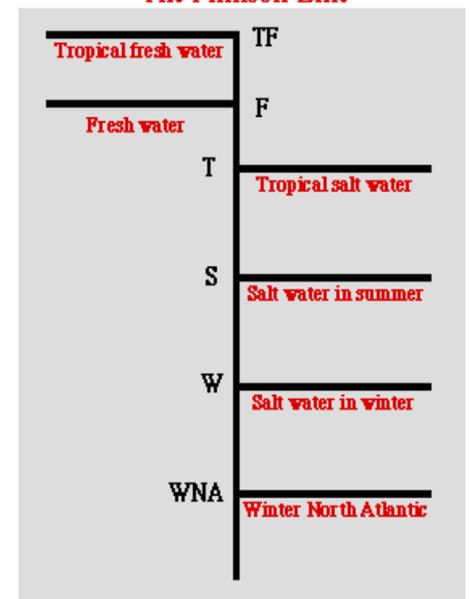
Q 90 d: Why load line is more important?

A 90, 90 a, 90 b, 90 c, 90 d:

LOADLINE

- The original "Plimsoll Mark" was a circle with a horizontal line through it to show the maximum draft of a ship.
- Additional marks have been added over the years, allowing for different water densities and expected sea conditions. Letters may also appear to the sides of the mark indicating the classification society that has surveyed the vessel's load line.
- The initials used include AB for the American Bureau of Shipping, LR for Lloyd's Register, GL for Germanischer Lloyd, BV for Bureau Veritas, IR for the Indian Register of Shipping, RI for the Registro Italiano Navale and NV for Det Norske Veritas.
- These letters should be approximately 115 millimeters in height and 75 millimeters in width.
- The Scantling length is usually referred to during and following

The Plimsoll Line



load line calculations.

The letters on the Load line marks have the following meanings:

- TF – Tropical Fresh Water
 - F – Fresh Water
 - T – Tropical Seawater
 - S – Summer Temperate Seawater
 - W – Winter Temperate Seawater
 - WNA – Winter North Atlantic
 - *IN OTHER SIDE FRONT OF MARKING THE WORD "L" INDICATE TIMBER LOAD LINE MARK.*
-
- Fresh water is considered to have a density of 1000 kg/m³ and sea water 1025 kg/m³.
 - Fresh water marks make allowance for the fact that the ship will float deeper in fresh water than salt water.
 - A ship loaded to her Fresh Water mark in fresh water will float at her Summer Mark once she has passed into sea water.
 - Similarly if loaded to her Tropical Fresh water mark she will float at her Tropical Mark once she passes in to sea water.
 - Various Load Line Markings in short The summer load line is the primary load line and it is from this mark that all other marks are derived. The position of the summer load line is calculated from the Load Line Rules and depends on many factors such as length of ship, type of ship, type and number of superstructures, amount of sheer, bow height and so on.
 - The horizontal line through the circle of the Plimsoll mark is at the same level as the summer load line.
 - **The winter load line** is one forty-eighth of the summer load draft below the summer load line.
 - **The Tropical load line** is one forty-eighth of the summer load draft above the summer load line.
 - **The Fresh Water load line** is an amount equal to centimeters above the summer load line where is the displacement in metric tons at the summer load draft and T is the metric tons per centimeter immersion at that draft.
 - In any case where cannot be ascertained the fresh water load line is at the same level as the tropical load line.

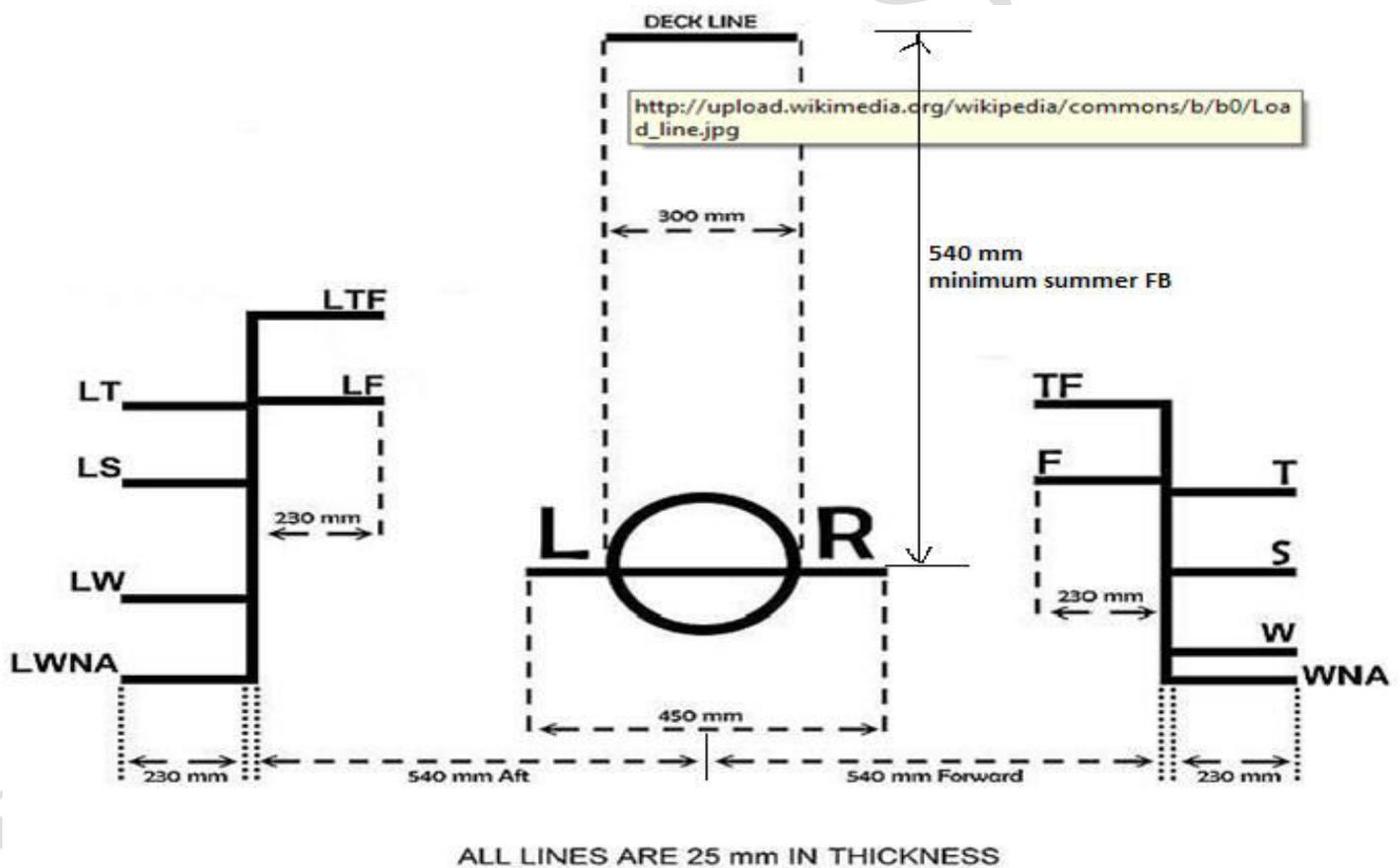
- The position of the Tropical Fresh load line relative to the tropical load line is found in the same way as the fresh water load line is to the summer load line.
- **The Winter North Atlantic load line** is used by vessels not exceeding 100 meters in length when in certain areas of the North Atlantic Ocean during the winter period. When assigned it is 50 millimeters below the winter mark.

It is called Plimsoll mark because Samuel Plimsoll invented this mark in 1930 international load line was enforced in around 54 country.

This mark will vary from vessel to vessel depend on length and gross tonnage.

It is on both side because if ship listed is STBD and marking on PORT side, when it tries to upright position so how you know and it is IMO regulation.

LOAD LINE CONVENTION



Adopted: 1966

Enforced: 21st JULY 1968

Protocol : 1988

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- It was adopted to establish, uniform principles and rules with respect to the limits to which ships on international voyage may be loaded and provide minimum free board for the safeguard of life, property & environment.
 - International Load Line certificates for 5 year validity.
 - All assigned Load Line must be marked a midship on each side of the ship, together with Deck line.
 - Certification and Load line marking is assigned by the Classification Society.
 - Load line certificate issued by Administration.
-

Q 91: What is loadicator?

A 91:

- Most Modern cargo ships are now equipped with loadicator systems or a loading computer with appropriate software.
- It is usually a conveniently sited visual display for the Master and the Loading Officers and is gainfully employed on Ro-Ro vessels, bulk carriers, tankers and other cargo ships.
- The main aim of the loading computer being to ensure that the vessel always departs the berth with adequate stability for the voyage. If this situation can be achieved quickly, costly delays can be eliminated and safety criteria is complied with.
- Ship's personnel could expect to become familiar with manipulation of the changing variables very quickly alongside the fixed weight distribution throughout the ship .This would include amounts of bunkers, water and stores are consumed and stability datas may change for arrival conditions.

The loadicator programmes provide output in the form of:

- Shear forces and bending moments effecting the vessel at its state of loading.
 - Cargo, ballast and fuel tonnage distributions.
 - A statement of Loaded 'GM', sailing draughts and deadweight.
-

Q 92: What id difference between AUDIT and SURVEY ?

A 92:

AUDIT :

- It always forecasts the post activity and then detect the fault and proper corrective action.
 - It focus on system operation, procedure, and documentation & software.
 - Always look on the system
 - Example:
Auditor will check satisfactory repair of pump and will enquire find and analyze as to when pump was last inspected and why deficiency not found before survey.
-

SURVEY:

- Survey focus on future activity so that equipment continue work for next survey.
- It focus on physical status of M/C.
- Focus on hard ware
- Survey of entire system is possible like equipment survey, M/E performance survey, Boiler survey.
- Example
In a survey of Fire pump surveyor will check satisfactory repair of pump noted deficiency removed.

Q 93: How the testing of E.G is carried out?

A 93:

EMERGENCY GENERATOR

- Emergency generator on ship provides power in case the main generators of the ship fails and creates a “dead or blackout condition”.
- According to general requirement, at least two modes of starting an emergency generator should be available.
- The two modes should be – battery start and hydraulic or pneumatic start.
- The Port state control (PSC) might detain a ship or provide some time to correct any kind of deficiency found if the second mode of starting is not operating.

Testing of Emergency Generator:

- The testing of ship’s emergency generator is done every week (as part of weekly checks) by running it unloaded to check if it starts on battery mode.
- The hydraulic start is done every month to ensure that it is working fine.
- Also every month automatic start of generator is also done to check its automatic operation and to see whether it comes on load.



Procedure for Battery Start: -

- Go to the emergency generator room and find the panel for emergency generator.
- Put the switch on the test mode from automatic mode. The generator will start automatically but will not come on load.
- Check voltage and frequency in the meter.
- Keep the generator running for 10-15 min and check the exhaust temp and other parameters.
- Check the sump level.
- For stopping the generator, put the switch in manual and then stop the generator.

Procedure for Hydraulic Start:

- Put the switch in manual mode as stated above and check the pressure gauge for sufficient oil pressure.
- Open the valve from accumulator to generator.
- Push the spring-loaded valve and the generator should start.
- Check voltage and frequency.
- Keep the generator running for 10-15 min and check the exhaust temp and other parameters.
- Check the sump level
- For stopping, use the manual stop button from the panel.
- After stopping the generator, pressurize the hydraulic accumulator to desired pressure.
- Close the valve from accumulator to generator.

Procedure for Automatic Start:

- For automatic start, we know that there is a breaker, which connects Emergency Switch Board (ESB) and Main Switch Board (MSB); and there is also an interlock provided due to which the emergency generator and Main power of the ship cannot be supplied together.
- Therefore, we simulate by opening the breaker from the tie line, which can be done from the MSB or the ESB panel.
- After opening the breaker, the emergency generator starts automatically with the help of batteries and will supply essential power to machinery and pumps connected to ESB.
- For stopping the generator, the breaker is closed again and due to the interlock the generator becomes off load.
- Now again put the switch to manual mode to stop the generator.
- Press stop and the generator will stop.

Requirements for emergency generating sets:

- Requirements for emergency generating sets involve starting in cold condition and starting energy-storing devices.
- Emergency generating sets shall be capable of being readily started at a temperature of 0°C.
- If this is impracticable, or if lower temperatures are likely to be encountered, provision shall be made for the maintenance of heating arrangements.
- Each emergency generating set arranged to be automatically started shall be equipped with starting devices approved by the Administration with a stored energy capability of at least three consecutive starts.
- A second source of energy shall be provided for an additional three starts within 30 min unless manual starting can be demonstrated to be effective.

The stored energy shall be maintained at all times, as follows:

- Electrical and hydraulic starting systems shall be maintained from the emergency switchboard;
- Compressed air starting systems may be maintained by the main or auxiliary compressed air receivers through a suitable non-return valve or by an emergency air compressor which, if electrically driven, is supplied from the emergency switchboard;
- All of these starting, charging and energy-storing devices shall be located in the emergency generator space;
- This does not preclude the supply to the air receiver of the emergency generating set from the main or auxiliary compressed air system through the non-return valve fitted in the emergency generator space.
- Where automatic starting is not required, manual starting is permissible, such as manual cranking, inertia starters, manually charged hydraulic accumulators, or powder charge cartridges, where they can be demonstrated as being effective.

THE EMERGENCY GENERATOR SUPPLIES POWER:

- In case of the failure of the main power generation system on the ship, an emergency power system or a standby system is also present.
- The emergency power supply ensures that the essential machinery and system continues to operate the ship.
- Batteries can supply emergency power or an emergency generator or even both systems can be used.
- Rating of the emergency power supply should be made in such a way that it provides supply to the essential systems of the ship such as: -
 - a) Steering gear system
 - b) Emergency bilge and fire p/p

- c) Watertight doors.
 - d) Fire fighting system.
 - e) Ships navigation lights and emergency lights.
 - f) Communication and alarm system.
- Emergency generator is normally located outside the machinery space of the ship. This is done mainly to avoid those emergency situations wherein access to the engine room is not possible.
 - A switchboard in the emergency generator room supplies power to different essential machinery.
- =====

Q 94:Regulation about air compressors - time required to fill the Air Bottles?

Q 94 a: Mounting on Air Bottle?

Q 94 b: Safety on Air bottle?

A 94, 94 a, 94 b:

- Two starting compressors must be fitted, of sufficient total capacity to meet the engine requirements.
- Each compressor must be able to press up Air receiver from 15 bars to 25 bars in 30 minutes.

Two air receivers must to be provided.

- Total air receiver capacity is to be **sufficient for Twelve (12) starts of Reversible engines and six (6) starts for non-reversible engines.**

Mounting:

- Fusible plug
- Relief valve
- Spring loaded safety valve
- Compensation ring
- Manual or Automatic Drain valve
- Pressure gauge
- Manhole
- Main starting air valve, Aux. starting air valve, filling valve, General service line

Safety on Air bottle:

- Fusible plug
- Pressure relief valve
- Low Air pressure alarm
- Drain valve

Q 95: What is the system to protect the Marine Growth in your ship?

A 95:

MGPS (MARINE GROWTH PREVENTION SYSTEM OR ANTI FOULING SYSTEM)

Principle: MGPS runs on electrolysis system

- The system produces anti-fouling on using specially alloyed anodes.
- There are two types known as the CU (copper) anodes and Al (aluminum) anodes.
- CU Anodes are manufactured from copper as major part for system.
- The copper anode produces ions which are transported by the seawater and carried into the pipework system to prevent marine Growth.
- They release ions during electrolysis as following reactions.



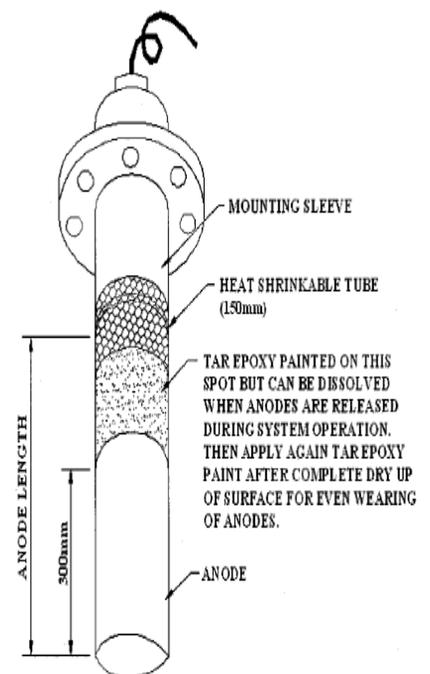
- AL Anodes are manufactured from aluminum as supplementary art for system.
- The slow dissolution of the aluminum anode produces a new high spread throughout the system and produce an anti-corrosively layer on the internal surface of sea water cooling lines.
- They release ions during electrolysis as following reactions.



There are two anodes

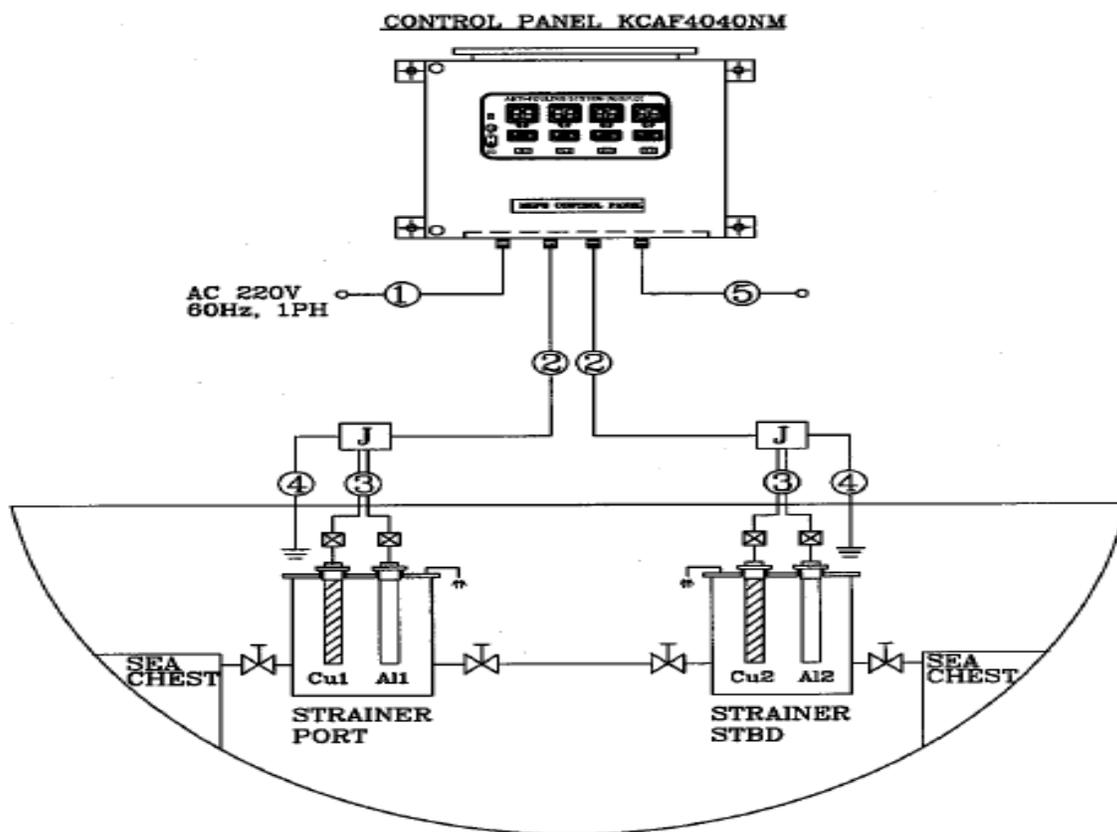
- (1) Copper
- (2) Aluminum

- They are fixed in pair into the sea-chest where they are in the direction of flow of water.
- The MGPS system consist a control unit which supplied Impressed Current to anodes.



Now what happens? How they reduce Marine Growth into pipelines and system?

- Marine Growth means sea-water contains marine organisms which will enter into ship and make deposits and flourish on the parts of the system.
- It can cause damage of part in longer period.
- It contains Macro and Micro organisms like shells, worm etc. etc.
- These organisms will stick into the pipelines where they will find some space to grow by giving temp, p^H , etc. and they start to breed.
- When this system is in operation Copper Anode produces ions which are carried by water into pipe and system



- Copper ions less than 2 parts per billion but enough to prevent marine growth.
- Which create unfriendly environment for marine growth
- And they have to discharge via discharge line.
- Due to Impressed current the Aluminum produces ions which spread over the system and produce Anti-Corrosive film over the pipes, and system internally.
- So they reduce Corrosion.

MEO CLASS 4 SAFETY (COSCPool) ORAL PREPARATION FILE PART 4

NOTE:
If you not apply proper Impressed current anodes can't work properly and those cause resulting in pipe corrosion and other cause which explained below.

*On my vessel
Cu : 2.7 amp
Al : 2.7 amp
When the sea chest not in use at that time its 0.4 amp*



Above picture are from my ship, when we saw our both Anodes get damage and we changed with New one by my self, elec, oiler, and 2nd engg.

CAUSES :

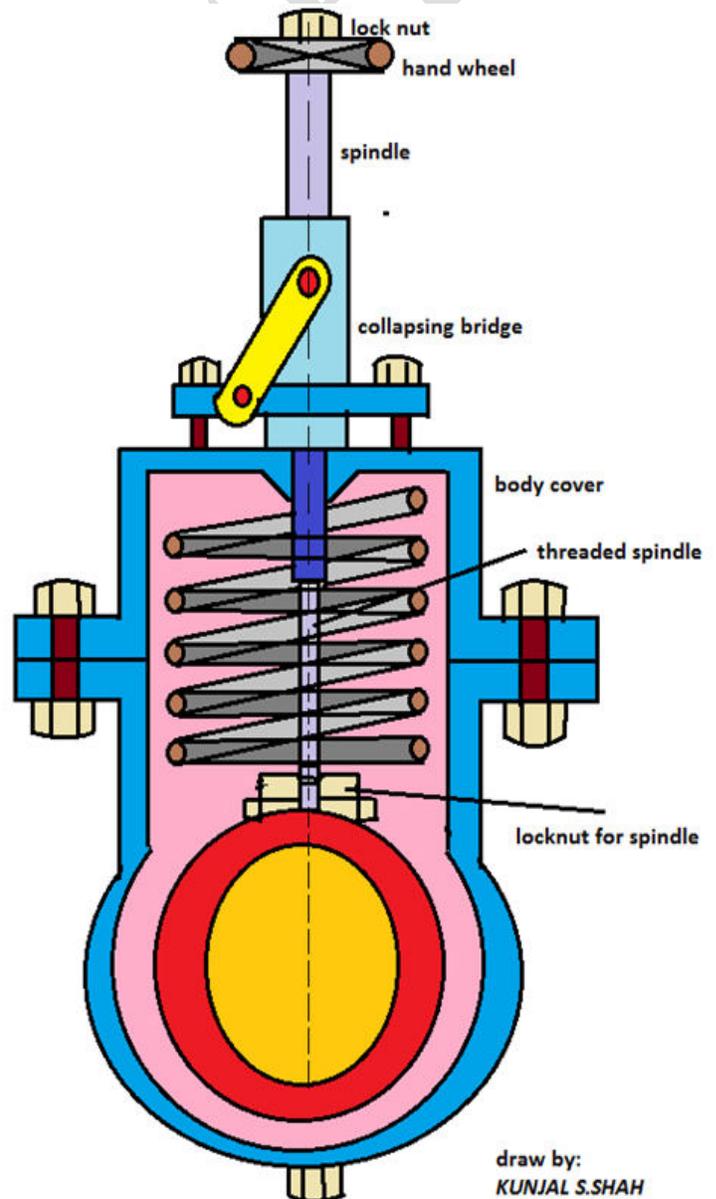
- They block the passage of cooling water.
- Heat transfer reduce
- Overheating of machinery
- Reduce thickness of pipe
- Increased corrosion
- Reduce efficiency which will reduce speed of ship.

Q 96: Draw cross-section and explain working of Quick closing valve ?

A 96:

Construction and Working:

- Quick closing valve is a kind of pressure reducing valve in which the an automatic process control valve for fluid pressure control is used for unmanned machinery spaces.
- This can be done by careful selection of valve trim, i.e. the parts of the valve that come in contact with the controlled fluid and form an actual control portion.
- The difference between pressure release valve and quick closing valve is that the later does not come in direct contact with the fluid it is controlling.
- The lever is connected externally to a remote operating mechanism which might be pneumatic or hydraulic controlled.
- The controlling system has a piston which moves with the pressure of air or fluid and simultaneously moves the lever attached to it.
- The lever at the other end is connected externally to the spindle which is attached internally to the valve.



- The valve is a spring loaded valve which means that the spindle is placed through a spring which helps in re-positioning of the valve to the open position when the air or fluid pressure in controlling cylinder reduces.
 - All the quick closing valves are generally set in the open position. When the piston of the controlling cylinder moves up, the end of the lever which is connected to the piston moves up.
 - As the lever is pivoted at the center, the other end of the lever moves down and pushes the spindle downwards. This closes the valve and shuts the flow of the fluid.
- =====

Q 97: How to measure Depth of the ship ?

A 97:

- ECO sounder work on principle of reflecting of an ECO of waves transmitted by wave generator and time is noted for wave to return
- If you know velocity of wave and time to return back it is possible to know distance travelled by the wave using formula:

$$S = V \times T$$

Where, S = Distance

V = Velocity

T = Time

=====

Q 98: New Amendments ? (friend for this question need to discuss each other)

A 98:

As of January 1, 2013, the International Maritime Organization has entered into force new regulations aimed at improving the energy efficiency of international shipping and preventing accidents during lifeboat launching. Here is what's new for 2013:

SOLAS Amendments

- Amendments to the International Convention for the Safety of Life at Sea (SOLAS) aimed at preventing accidents during lifeboat launching entered into force on 1 January 2013.
- The amendments, adopted in May 2011, add a new paragraph 5 to SOLAS regulation III/1, to require lifeboat on-load release mechanisms not complying with new International Life-Saving Appliances (LSA) Code requirements to be replaced, no later than the first scheduled dry-docking of the ship after 1 July 2014 but, in any case, not later than 1 July 2019.

- The SOLAS amendment is intended to establish new, stricter, safety standards for lifeboat release and retrieval systems, and will require the assessment and possible replacement of a large number of lifeboat release hooks.
- Information submitted by flag States on their assessments of existing lifeboat hooks is available on the Global Integrated Shipping Information System (GISIS) under Evaluation of Hooks.

MARPOL Amendments

- The amendments to the International Convention for the Prevention of Pollution from Ships (MARPOL) were adopted in July 2011.
- New regulations aimed at improving the energy efficiency of international shipping entered into force on 1 January 2013. A new chapter 4 Regulations on energy efficiency for ships to MARPOL Annex VI, to make mandatory the Energy Efficiency Design Index (EEDI), for new ships, and the Ship Energy Efficiency Management Plan (SEEMP) for all ships. Other amendments to Annex VI add new definitions and the requirements for survey and certification, including the format for the International Energy Efficiency Certificate.
- The regulations apply to all ships of 400 gross tonnage and above. However, under regulation 19, the Administration may waive the requirements for new ships up to a maximum of 4 years.
- The EEDI is a non-prescriptive, performance-based mechanism that leaves the choice of technologies to use in a specific ship design to the industry.
- As long as the required energy-efficiency level is attained, ship designers and builders would be free to use the most cost-efficient solutions for the ship to comply with the regulations.
- The SEEMP establishes a mechanism for operators to improve the energy efficiency of ships. Ships are required to keep on board a ship specific Ship Energy Efficiency Management Plan (SEEMP).
- Additional MARPOL amendments which entered into force on 1 January include the following.

Annex VI Emissions

- Amendments to MARPOL Annex VI designate certain waters adjacent to the coasts of Puerto Rico (United States) and the U.S. Virgin Islands (United States) as the US Caribbean Sea Emission Control Area for the control of emissions of nitrogen oxides (NOX), sulphur oxides (SOX) and particulate matter under regulations 13 and 14 of MARPOL Annex VI.
- Another amendment makes old steamships exempt from the requirements on sulphur content of fuel oil used on board ships in both the North American and United States Caribbean Sea ECAs.
- The new US Caribbean Sea ECA takes effect 12 months after entry into force, that is, 1 January 2014.

Annex IV Sewage

- Amendments to MARPOL Annex IV Prevention of pollution by sewage from ships include the possibility of establishing Special Areas, the actual designation of the Baltic Sea as a Special Area under Annex IV, and the introduction of stricter discharge requirements for passenger ships while in a Special Area.

Annex V Garbage

- The revised MARPOL Annex V Regulations for the prevention of pollution by garbage from ships has entered into force, following a comprehensive review to bring the Annex up to date.
- The main feature of the revision is the prohibition of the discharge of all garbage into the sea except as expressly provided otherwise in the Annex.
- The discharges permitted in certain circumstances include food wastes, animal carcasses, cargo residues, and water containing cleaning agents or additives used for washing deck and external surfaces or cargo holds.
- Cargo residues and cleaning agents and additives must only be considered for discharge if they are not harmful to the marine environment.
- The changes also include the updating of definitions; the introduction of an “en route” requirement for the discharge of garbage at sea; and the regrouping of the garbage categories for the purpose of the garbage record book.

=====

Q 99: As my bad luck on my 2nd attempt surveyor asked tell me your ship’s accommodation length?

Q 99 a: Then he asked me how to secure container in hold ?

Q 99 b: Then he asked me to draw a ship and explain cargo hold length ?

Q 99 c: Then he asked me tell me how many container you was carried in your Deck and Cargo hold ?

A 99, 99 a, 99 b, 99 c:

Friend’s in my 2nd attempt I was stuck, with this kind of question. But I don’t want that you guys also be stuck like me.

So keep your ship detail

=====

Q 100: Draw Your ship mid ship section ?

A 100:

I sailed on Container so here you have only container ship C/S.

TEU : Twenty foot equivalent unit

20 foot = 6.1 m = 1 TEU

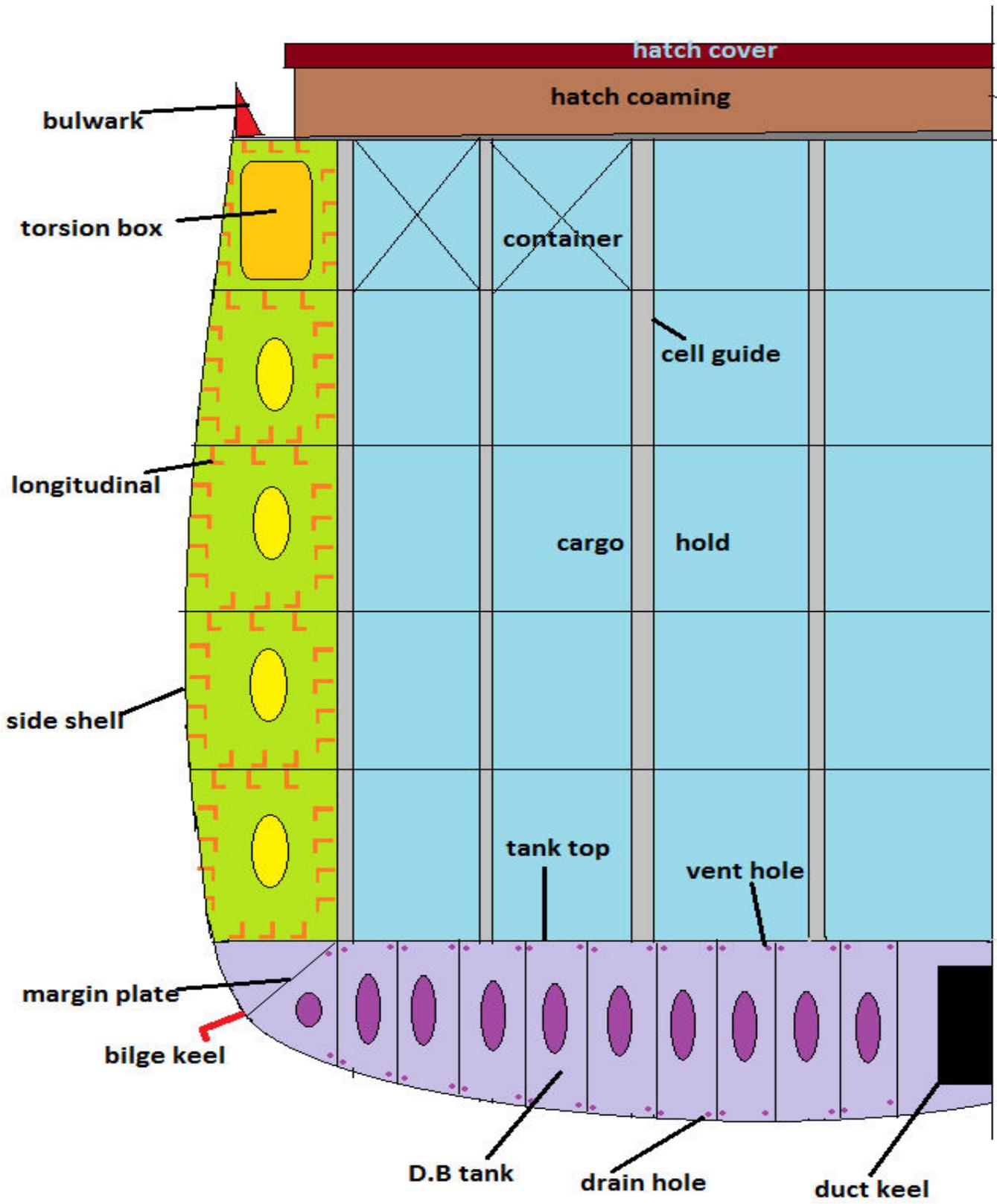
1 Container size : 20 × 8(width) × 8.6 (height)

FEU : forty foot equivalent unit

40 foot = 12.192 m = 1 FEU

1 container size : 40 × 8(width) × 8.6(height)

CROSS-SECTION OF CONTAINER SHIP



draw by :
Kunjai S. Shah

Tare weight :

It is the weight of an empty container

It is weight of the thing that the object will be placed into

If a machine is 100 kg, its called Net weight and to put in container and its weight is 50 kg is called tare weight

$$\begin{aligned} \text{Gross weight} &= \text{Net weight} + \text{Tare weight} \\ &= 100 + 50 = 150 \text{ kg} \end{aligned}$$

=====

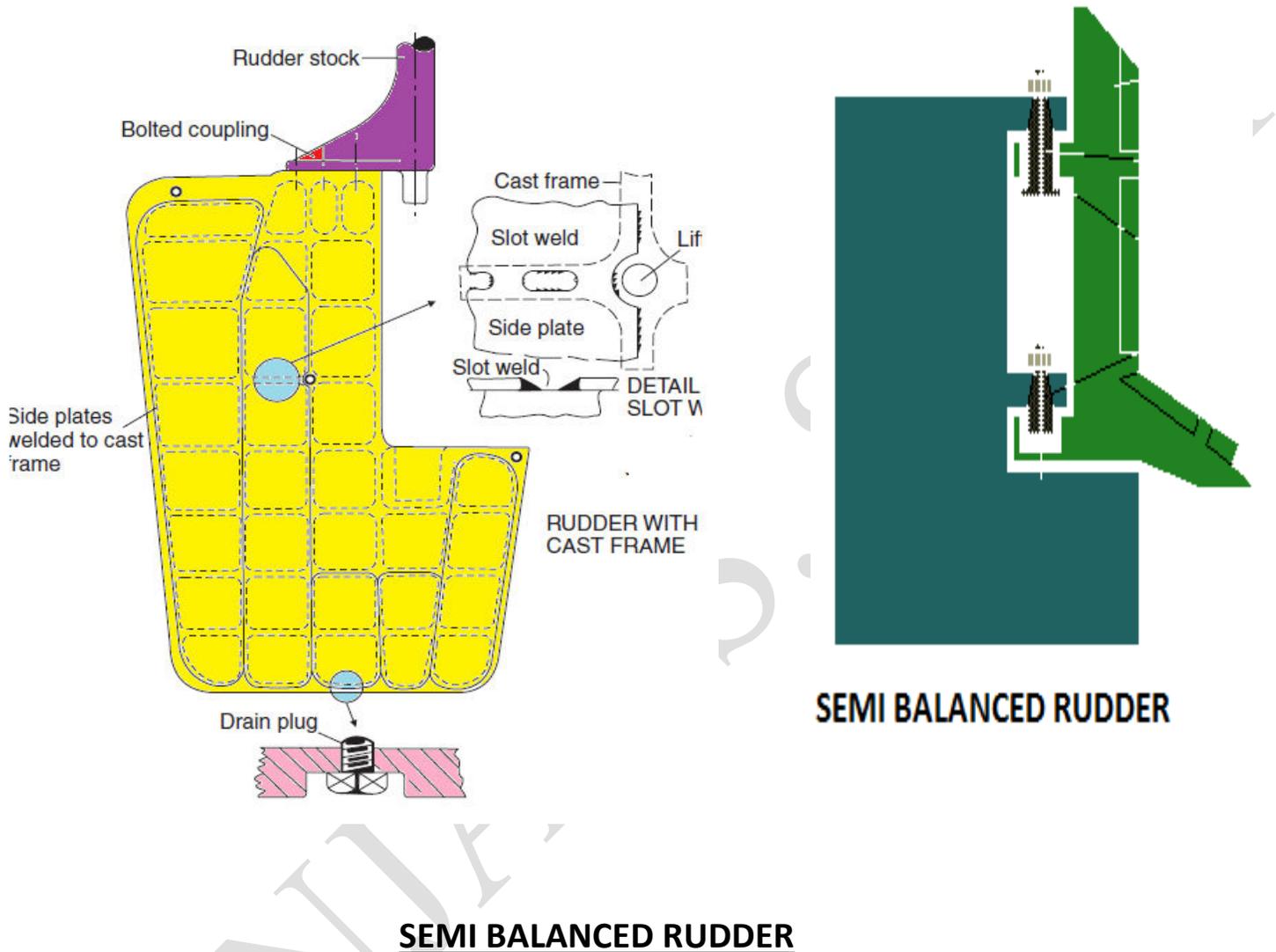
Q 101 : Explain Rudder and Draw Rudder which was on your ship?

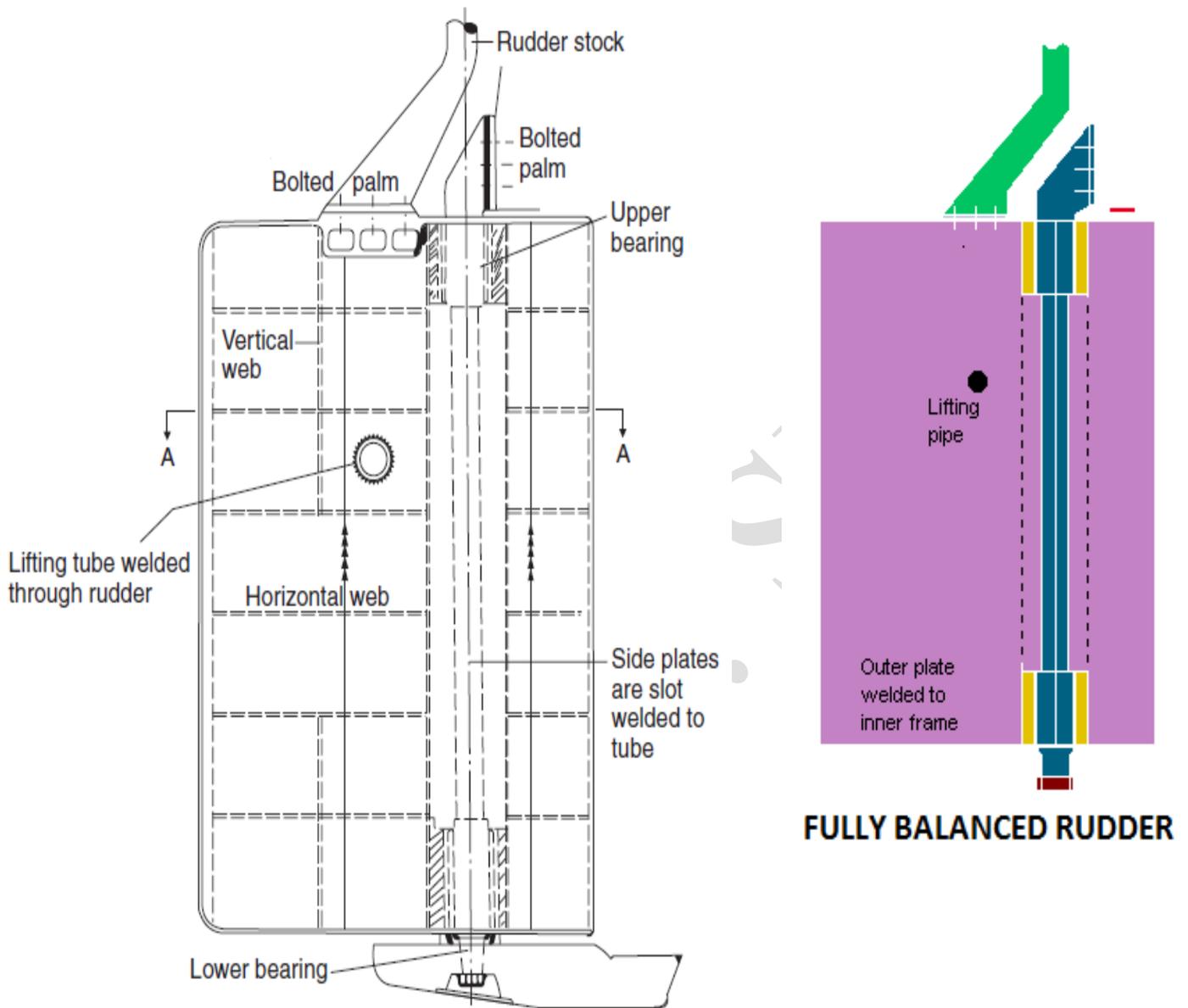
A 101:

- A rudder allows the ship to turn, simple plates have been superseded by plates welded to cast or fabricated frame. Rudders are hollow and so provide for some buoyancy .
- In order to minimise the risk of corrosion internal surfaces are provided with a protective coating and some are even filled with foam.
- A drain plug is provided to allow for the drainage of water , enable internal inspection to be made using fiber optic device and even allow for the limited application of a protective coating.
- Plates are welded to the frames internally in order to provide flush fitting , the final closing plate must be welded externally.
- A means of lifting is provided taking the form of a tube as close to the center of gravity as possible. Rudders are tested to a pressure head 2.4m above the top of the rudder.
- If the rudder has its entire area aft of the rudder stock then it is unbalanced .
- A rudder with between 20 and 40% of its area forward of the stock is balanced since there will be some angle at which the resultant moment on the stock due to the water force will be zero.
- Most modern rudders are of the semi-balanced design.
- This means that that a certain proportion of the water force acting on the after part of the rudder is counter acted by the force acting on the for'd half of the rudder; hence, the steering gear can be lighter and smaller.
- A rudder may lift due to the buoyancy effect, the amount of lift is limited by the jumper bar fitted to the stern frame.
- The jumper/rudder clearance must be less than the steering gear cross head clearance to prevent damage.
- A rudder is supported by means of a bearing pintle or a lower bearing depending upon the design.

MEO CLASS 4 SAFETY (COSCPPOOL) ORAL PREPARATION FILE PART 4

- Where a lower bearing is employed the rudder is actually supported on split bearing rings fitted on the lower face of the rudder and the upper face of the sole piece (the extended lower section of the stern frame upon which the rudder sits)



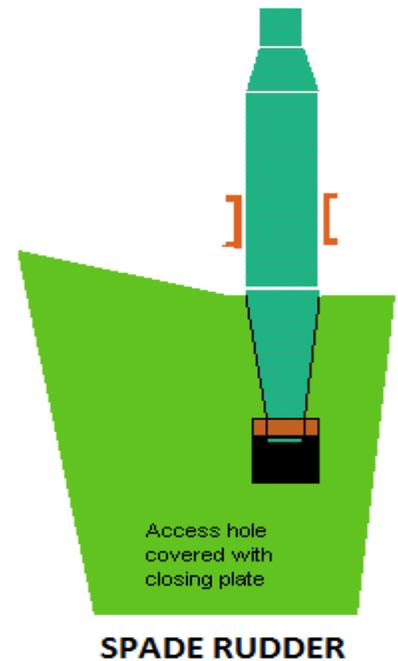


Fully balanced rudder

- To reduce the amount of torque required to turn a rudder the pivot point is moved back from the leading edge.
- The amount of torque then varies depending on the angle of attack. Zero torque leads to instability with rudder moving within its clearances.

Spade Rudder

- The reduced diameter at the upper part is purely to transmit torque.
- The lower section must also support bending moments and hence increased diameter.
- With twin rudder ships the inner rudder must turn through a greater angle than the outer.
- This is achieved by having the tiller arm at an angle to the centre line of the rudder.
- It is possible to have the blades angled in or out when the wheel is amid ships to increase propulsive efficiency.

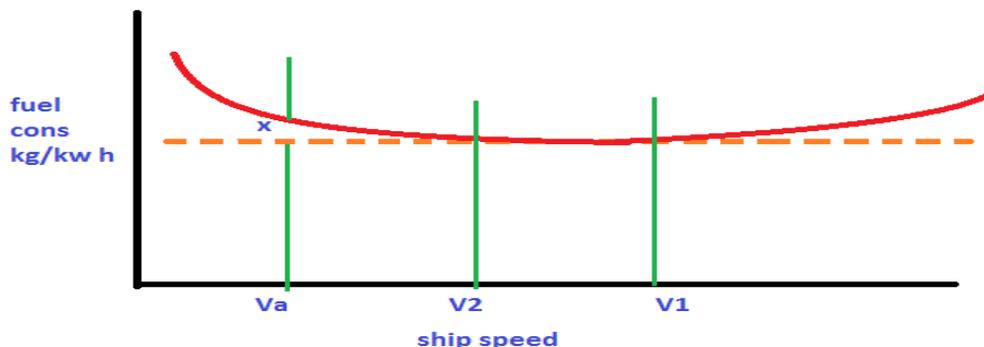


Q 102 : What is the formula in Relation between fuel consumption and speed of ship?

A 102 :

FUEL COEFFICIENT AND FUEL CONSUMPTION

- The fuel consumption of a ship depends upon the power developed, indeed the overall efficiency of power plant is often measured in terms of the specific fuel consumption which is the consumption per unit of power, expressed in kg/h.
- Efficient diesel engines may have a specific fuel consumption of about 0.20 kg/kW h, while that for a steam turbine may be about 0.30 kg/kW h
- The specific fuel consumption of a ship at follows the form shown in Fig.



Fuel consumption per day : $\frac{\Delta^{\frac{2}{3}} V^3}{\text{fuel consumption}}$ tonne

Value of fuel coefficient: between 40000 and 120000

$$\text{SFOC} : \Delta^{\frac{2}{3}} \times V^2 \times D$$

- ❖ *Friend's I hope this file will help you a lot to be clear COSCPPOOL (SAFETY) oral exam.*
- ❖ *There are so many small small thing that surveyor can ask you from one by one.*
- ❖ *You guys have to be complete concentrate on each and every line what I wrote.*
- ❖ *Frankly telling you, I am not a genius person, but when I started to prepare my oral exam, I was looking for one such a file that only will cover most of the topic, but I didn't found in any of our group.*
- ❖ *Then I thought that when I will clear my oral and in between getting COC, I would like to make a file which can be include around 95 % topic.*
- ❖ *And I started just after complete my oral to write this file.*
- ❖ *Some where I just copy and paste, some where I wrote about some good important thing, diagram which you can see in this file that all of them are made by me only.*
- ❖ *If any of the topic left you can consider as my fault.*
- ❖ *If you found any thing wrong just let me know, I will try my best to be correct.*
- ❖ *If you like to add some thing for that also contact me.*

Best Of Luck

My all MEO Class 4 friend's

YOUR FRIEND

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