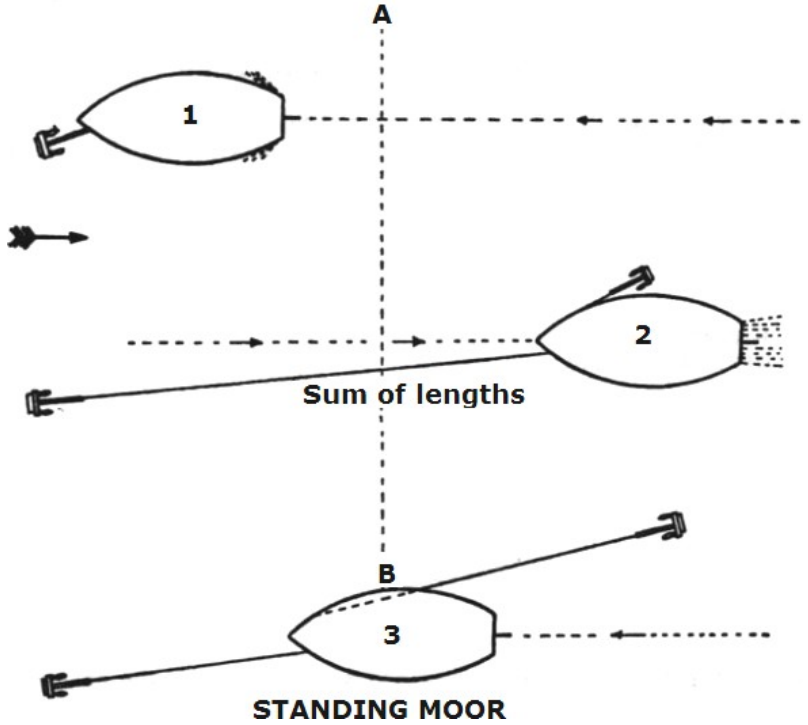
Function 3

- During the middling of the vessel to the required position, the engines may be used ahead or astern to reduce stress on the windlass.
- In calm weather, it is better to drop the Port anchor first at Position 1, as any astern movement to reduce headway will cant the stem away from the anchor.
- Standing moor is comparatively safer as the anchor is let go after the vessel has stopped. This reduces the possibility of damage to the anchor which is higher when anchored under headway (as in the case of Running Moor). It can also be performed without use of the engine.



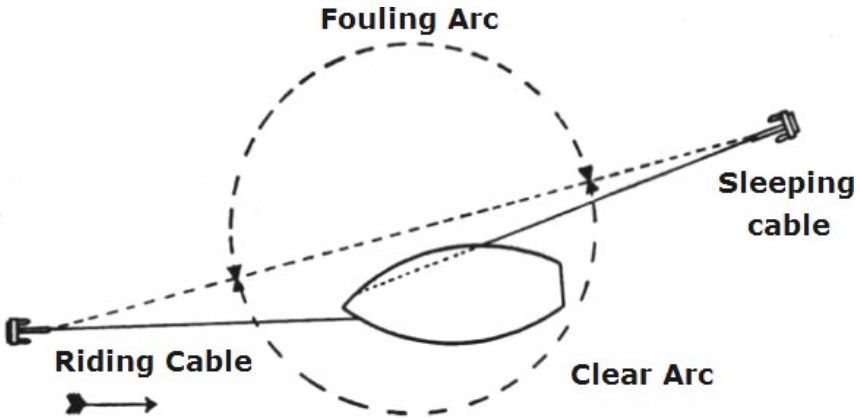
STANDING MOOR

- A standing moor is sometimes preferred over a running moor when the tidal stream is very strong. There is always a risk for foul hawse. Hence, a constant watch must be maintained to prevent foul hawse.
- The foul arc and clear arc must be determined. Vessel should always swing to clear arc on each tidal change. Engines may be used to give vessel necessary sheer.

Mooring is usually taken to mean securing the ship with two anchors, one ahead and one lying astern – a cable each way, as it was once called.
The upwind or upstream anchor is known as the riding anchor and cable, the other being called the sleeping or lee anchor and cable.

By Anuj Kumar

Function 3



MEDITERRANEAN MOOR

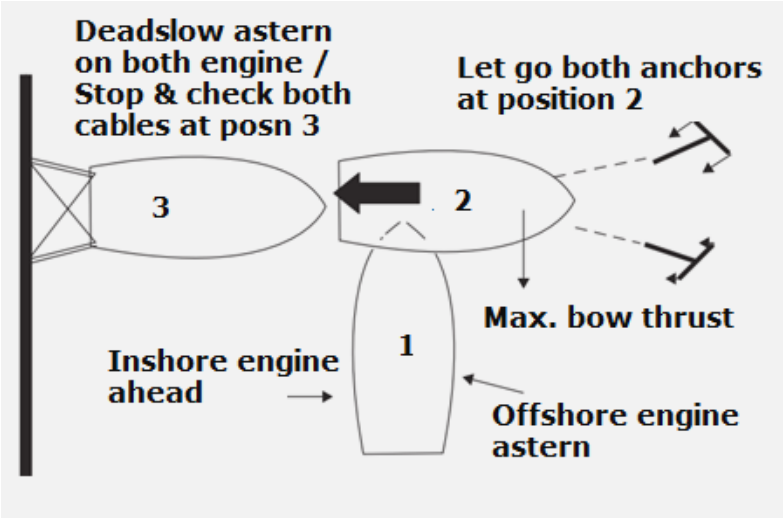
- This moor is carried out usually for one of two reasons – either quay space is restricted and several vessels are required to secure or a stern loading/ discharge is required. (As for a tanker.)
- The object of the manoeuvre is to position the vessel stern to the quay with both anchors out in the form of an open moor. The stern of the vessel is secured by hawsers from the ship's quarters to the quay.
- The manoeuvre greatly depends on the prevailing wind but let us assume calm weather with no current or wind.
- The approach should preferably be made with the berth on port side, as parallel to the quay as possible. Let go the offshore (stbd) anchor. Main engines should be ahead and dead slow. The bow may be initially made to cant towards the berth while letting go the offshore anchor.
- The vessel continues to move ahead. Starboard helm is now applied as the starboard cable is veered. Once the vessel begins to swing to stbd, the engines are stopped. On reaching position 3, the engines are put astern and the port anchor is let go.
- As the vessel comes astern, transverse thrust swings the stern to port towards the berth and the port side cable is veered, with any slack cable on the offshore anchor heaved.
- The vessel is then manoeuvred using engines & cable operation until she is at within heaving line distance of the quay. Once she is within heaving line distance, stern lines are sent away.

- The disadvantage is that the vessel is not a favourable position in bad weather. Also, there is a possibility of fouling anchor cables, especially when other vessels are moored in a similar manner close by. It is also not practical in deep water or places with large tides.
- Modern vessels equipped with twin propellers and bow thrusters make the Mediterranean Moor look quite simple.
- The approach can be from either side of the quay. (Port or Stbd).
- Once the centre position of the intended berth is reached, all way should be taken off the ship, prior to commencing a turn in the offshore direction.
- The inshore engine should be placed ahead, with the offshore engine placed astern and maximum bow thrust should be given in order to turn the vessel about the midship point. Once the stern is facing towards the quay, both anchors are simultaneously let go at position 2 and both engines are placed on dead slow astern.

By Anuj Kumar

Function 3

- Vessel must then be manoeuvred to position 3 using engines & cables so that stern lines can be passed. Tension on the moorings is achieved by putting weight on to the cables once the moorings have been secured on bitts.



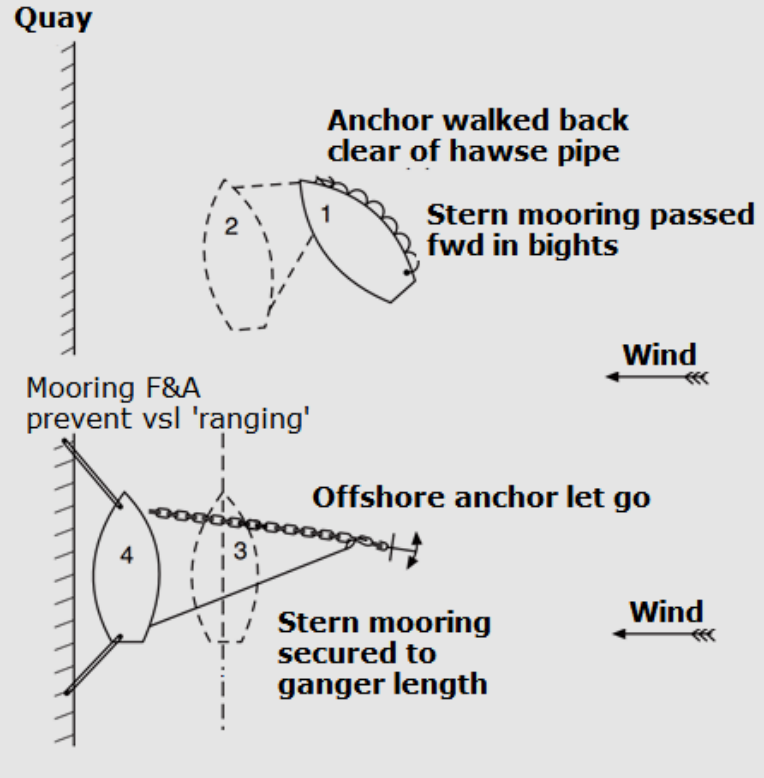
BALTIC MOOR

- This moor is employed alongside a quay where strong onshore winds are experienced and when construction of the berth is not sufficiently strong to withstand ranging of vessel in bad weather.
- The vessel should approach the berth with the wind on the beam or slightly abaft the beam. The procedure is as follows:
- Before the approach has begun, a stern mooring wire is passed from the after ends on the poop, along the offshore side, outside and clear of everything. The wire is secured with ship's rail in bights using light seizings.
- The offshore anchor is cock-a-billed and a man is sent overside on a chair to secure the wire with the anchor, preferably at the shackle. The aft end of the wire is sent to a warping drum, ready for heaving up slack wire.
- The vessel is manoeuvred to a distance off the berth of 2 or 3 shackles of cable. This distance will vary with wind force & weather conditions.
- When the stem is about the middle of the final position, and vessel has lost headway, the offshore (stbd) anchor is let go with the bow slightly canting inshore (to port) . The weight of the anchor and cable will cause the light seizings to part and as the cable pays out, so will the stern mooring wire.
- The wind will push the vessel alongside, while the cable and the stern wire are paid out evenly together.
- Ship’s fenders must be used along the inshore side.
- Head lines and stern lines must be passed as soon as practical and secured on the bitts before taking the weight on the anchor cable and the stern mooring wire.
- Once the inshore (port) moorings are made fast, the anchor cable and the stern mooring wire can be tightened so as to harden up the inshore (port) moorings.
- When the vessel has to depart the port, unless she is fitted with bow thrusters, the Master may encounter difficulties in clearing the berth. However, heaving on the anchor cable and on the stern mooring will allow the vessel to be bodily drawn off the quay. Once clear of the berth, full use of engines and helm can be made to get under way.

By Anuj Kumar

Function 3

- It is very important to let go the offshore anchor at the best possible position. For if the anchor is let go too far off the quay, the stern wire will be of insufficient length and the ship will fail to reach the berth. If this happens, the anchor must be weighed and the manoeuvre repeated.
- Also, if there is no wind at the time of berthing, the cable and wire are kept slack and the vessel is manoeuvred to the berth under engine power and helm



DREDGING DOWN

- A vessel is said to be ‘dredging down’ when she is moving under the influence of the tidal stream, with an anchor just on the bottom. The amount of cable out is limited to the minimum required to drag the anchor along the bottom.
- Her speed over ground is therefore retarded and the vessel does not move as fast as the current. - This makes the rudder effective and allows the ship to manoeuvre.
- This is often employed for berthing operations and when used in conjunction with bold helm, the direction of the ship’s head can be appreciably changed. However, it must be noted that for the rudder to be sensitive, a strong tidal stream is necessary.

DROPPING DOWN

- A vessel is said to ‘drop down’ when she drifts with the tidal stream.
- A vessel at anchor wishing to do this will heave up the anchor just clear off the seabed.
- Her speed through water will be NIL, but her speed over ground will be equal to that of the stream.
- Her rudder will have no effect as there is no water flowing past it. She cannot be controlled except by means of her engines or her anchors.

ANCHORING AT HIGH SPEED:

By Anuj Kumar

Function 3

- In case of emergency, both anchors should be let go and allowed to run out their cable until sufficient is out to enable the anchors to hold. They are then snubbed and perhaps alternately veered and snubbed so that the ship gradually loses her way. Both cables will be growing astern throughout the operation, and both will be subject to bad nips.
- It must be noted that the hawse pipe lips are relieving the windlass of much stress and the cables are taking an equal share.
- A ship with quite considerable headway may be brought up quite rapidly with two anchors used in this fashion. Afterwards, the anchors, cables, hawse pipe and windlass should be surveyed. Large tankers may well part their cables when anchoring at speeds above 1 knot.
- If the ship uses only one anchor, she is likely to part the cable quickly and then forge ahead into danger, with the second anchor idle in the pipe.
- If there is insufficient room to pay out a sufficient scope, the cables must be snubbed sufficiently enough to have the anchors dragged along the bottom to reduce headway. This is highly dangerous in harbours or places where there are submarine cables.

WEIGHING ANCHOR

- If during heaving, the cable is subjected to bad nip, the windlass brakes should be applied and the bows should be allowed to swing so that the cable grows clear. If there is too much stress on the cable, the Bridge must be informed. Engines movements can be used to relieve the stress.
- The cable should be well washed while heaving and well stowed. If the anchor wash from the hawse pipe itself is not enough, a hose can be rigged to jet-mode to clean the cable as it comes up. If the anchor is fouled with sea-bed material, it can be towed awash for a short distance at slow speed.
- The Bridge must be informed about the number of shackles as they come up the water surface and finally when the anchor is aweigh, sighted and clear.
- Once the anchor is aweigh, the anchor ball must be lowered or deck lights and anchor lights switched off and navigation lights must be switched on.
- The anchors should be fully secured if deemed no longer necessary for immediate use.

By Anuj Kumar

Function 3

Various Codes / Convention

Q. What is ISM ?

The purpose of the ISM Code is to provide an international standard for the safe management and operation of ships and for pollution prevention.
The ISM Code was adopted in 1993 and became mandatory under SOLAS Chapter IX on July 1, 1998. It applies to all ships over 500 gross tonnage engaged in international voyages, including passenger ships, oil tankers, chemical tankers, and bulk carriers.

Q. Objective of ISM Code?

The objectives of the Code are to ensure safety at sea, prevent human injury, ensure personnel safety, and avoid damage to the environment, especially to the marine environment.

Q. Chapters of ISM? / Contents of ISM?

PART A - Implementation
1. General (Definitions, Objectives, Application, Functional requirement of SMS)
2. Safety and environmental protection policy
3. Company responsibilities and authority
4. Designated Person Ashore (DPA)
5. Master's responsibility and authority
6. Resources and personnel
7. Development of plans for shipboard operations
8. Emergency Preparedness
9. Reports and analysis of non-conformities, accidents and hazardous occurrences
10. Maintenance of the ship and equipment
11. Documentation
12. Company verification, Review and Evaluation

PART B – Certification & Verification
13. Certification and periodical verification
14. Interim Certification
15. Verification
16. Forms of Certificates

Q. Implementation of ISM

1. Ensure the SMS is functioning correctly on board the vessel
- Verifying the implementation of the SMS on an ongoing basis is best achieved by using a sampling process.
- Assisting master or providing feedback to ship's master in reviewing or fater review the various records monthly to ensure that the required actions are being correctly performed. They could then check for defects and records of incidents and accidents.
- Assisting master to ensure that the required training and drills are being conducted on an ongoing basis.
- Assisting master in ships emergency preparedness

Function 3

- Ensuring crew familiarization with the SMS and job
- Operational and maintained PMS
- Conducting RA for the shipboard operations

2. Regularly auditing the vessel to ensure compliance with Environment policies
- SEEMP is in place and operational
- Garbage management & Records
- BWM & records
- Fucntional MARPOL equipment like ODME equipment is functioning and being correctly recorded in the ORB

3. Preparations for audits under the ISM Code
- Ensuring that the correct documents, certificates, procedures, records and reports are on hand
Hours of rest Crew training and drill record
Checklist folders for procedures
Crew familiarisation records
Bridge and navigation records
Up-to-date bridge p/ps, corrections and publications
Drill and training records
Procedures in place for principal operations
Procedures being followed

4. Handling NC & Record of non-conformities
- All Non-Conformities must be closed out after verification that any corrective and preventive action has been carried out by responsible personnel.
- Office personnel should investigate and analyse the non-conformity aiming to identify the root cause.
- Afterwards, an action plan on how to correct the non-conformity should be decided as well as all actions need to be taken in order to prevent similar reoccurrences.
- In case of shipboard audits, corrective actions should be decided between the Master and the Auditor, but the DPA (Designated Person Ashore) should finally review the incident and proceed, if appropriate, with modifications.
- Also, for vessel related non-conformities, it is necessary to communicate the preventive actions to the whole fleet.

Q.Master's management of change meeting purpose
- To enable smooth takeover
- To identify any pending PMS, Audit & Inspections
- To idenfy any ongoing NC actions, corrective action
- To Identify any aspect which important to improve or maintain safety of ship and crew and environment.

Function 3

Q. Procedure for NC closure

Distinguish between the direct cause of the nc (e.g., someone not following a process) and the root cause (the reason behind not following the process).
The root cause should not be a repeat of the nonconformity or the direct cause and should not attempt to explain or justify the direct cause.
If multiple root causes are identified, there must be corrective action plans established for each. For instance, if training and inadequate work instructions are root causes, create separate corrective action plans.
The corrective action must address the root cause(s) determined in the root cause analysis. This needs to include precise actions, responsibilities, and completion dates.
In order to accept the evidence of implementation, there must be sufficient evidence demonstrating that the plan is in progress.
Remember that full evidence is not always required to close a non-conformity. Some aspects may be carried forward to future assessments in order to verify full effectiveness.

Q. Observation and Non conformity defination

Q. Difference between major NC and non major NC

An observation is a statement of fact made during an ISM audit that is substantiated by objective evidence. An example of this would be objective evidence showing that a certain record is unavailable. If LSA safety checks for June were missing, but all equipment and other records were present and correct, this would suggest that the records had gone missing, not that the crew had failed to carry out checks as required by the SMS.

A non-conformity is an observed situation where objective evidence indicates the non-fulfilment of a specific requirement of the SMS.
An example of this might be when objective evidence shows that pre-arrival checklists were not completed on multiple occasions due to the time constraints of arriving in port. Since SMS explicitly requires the completion of these forms, failure to do so beyond an isolated clerical error constitutes a non-conformity.

A major non-conformity is a deviation that:
poses a serious threat to the safety of personnel or the ship, or
poses a serious risk to the environment that requires immediate corrective action, or
shows a lack of effective, systematic implementation of a requirement of the code
An example of this would be when objective evidence indicates that a vessel is insufficiently manned, according to the Minimum Safe Manning Document. Here, the vessel cannot set sail until the principles of safe manning are observed.

Q. Certificates under ISM. Surveys and certification under ISM.

In accordance with the ISM Code and upon satisfactorily results, Flag or RO issues
- DOC (Document of Compliance)
A Document of Compliance (DOC) is issued to a Company when the shore side aspects of the Safety Management System are found to comply with the requirements of the ISM Code.

Function 3

A copy of the relevant DOC should be placed on board each of the company's ships, which may be accepted as evidence that the Company's shore-side management structure complies with the requirements of the Code.

DOC is issued by the authority of flag state government, (DGS in India) by positively auditing and reviewing companies SMS and its implementation
- SMC (Safety Management Certificate), issued to each ship

The ISM certification procedure consists of the following steps.
For the Company: Document of Compliance (DOC):
1. review of Safety Management System documentation
2. interim audit for issuance of interim DOC (valid one year)
3. initial audit and issuance of full term DOC (valid five years)
4. after the full term certificate issuance, 4 annual audits and DOC renewal audit after 5 years.

Interim Document of Compliance (Interim DOC):
- Issued to new companies or when adding new vessel types to an existing SMS.
- Valid for a limited period (up to 12 months).

Types of audits:
Company - Interim, Initial, Annual, Renewal, Additional audits, Surveillance audits
Ship- Interim Audit, Initial audit, Intermediate audit, Renewal, Additional audit

For the Ship: Safety Management Certificate (SMC):
1. after DOC issuance to the company, Interim audit for issuance of interim SMC, valid six months
2. initial audit and issuance of full term SMC (valid five years)
3. intermediate audit follows 3rd year of the certification period
4. SMC renewal after 5 years.

Interim Safety Management Certificate (Interim SMC): Issued for new ships on delivery or when a company takes responsibility for a new vessel. Valid for a limited time until a full SMC can be issued.

Certification Process
1. Application Submission for DOC Audit
- The companies are required to apply to Chief Surveyor with the GOI, in the prescribed format (Form ISM-03) along with fees
On receipt of the application, names of auditors and date of audit will be informed to company and auditors through a letter and sometime by e'mail. After receiving the auditors' nomination, the company must liaise with the auditors to get the audit done on that date or any other date that is mutually agreed upon.

2. Audit Process
Interim DOC Audit

Function 3

- An Interim DOC is issued to facilitate initial implementation of ISM Code to
1. A newly established company or
2. When new ship types are added to an existing DOC

- Applications on company letterhead with following enclosures are to be submitted to ISM Cell, DGS.
Company SMS manuals.
ISM'03 Form with fees.
ISM-11/12 Forms
Company incorporation Certificate.
Copies of ownership / lease agreements / rental agreements for the office premises.
- On receipt of the application, Auditor is nominated to scrutinize the SMS Manuals.
- The nominated auditor hands over the SMS manuals to company on completion of scrutiny with intimation to DGS on the status of SMS manual. The company should submit the amended final approved SMS manual in soft copy to the ISM Cell of DGS.
- On receipt of communication from auditor, the ISM Cell nominates auditors for carrying out Interim DOC audit.
- The DGS issues Interim DOC for a maximum period of 12 months on receipt and scrutiny of Interim DOC Audit report from the audit team.
- The company is required to submit SMS implementation plan and 12 months are given to the company for fulfilling the ISM requirements.
- After obtaining this certification, the company is eligible to take over Indian flag vessel for technical management of the ship types as indicated in their interim DOC / DOC.

DOC' Initial Audit: '
- The company is eligible to apply for Initial DOC Audit on implementation of SMS for at least 3 months on the vessel and in company
- Application on letterhead of company with following enclosures is to be submitted to ISM cell, DGS:
ISM' 03 with fees
On receipt of application, ISM Cell, DGS nominates auditors and there after the procedure given at Para B is to be followed.

- The DGS issues DOC for a maximum period of 5 years on receipt and scrutiny of initial DOC Audit report from the audit team
- This DOC is valid subject to annual verification of SMS (Annual DOC audit).

- This involves:
1. Reviewing SMS manuals and procedures.
2. Conducting onboard inspections to verify implementation.
3. Assessing compliance with ISM Code requirements.
4. Issuance of Certificates

- 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.

By Anuj Kumar

Function 3

Validity of short term DOC is 5 months.
Full term DOC Issued after at least three months of implementation of SMS at the company and at least one ship in the fleet for which DOC is concerned.

Company in possession of Interim DOC or DOC is eligible to apply for Interim SMC audit for ship when takes on responsibility for the operation of a ship (DOC should be relevant to the ship type) that is new to the company.

SMC
It is issued by the administration after successful completion of initial audit or fulfilment or interim SMC requirements.
The validity of SMC, after initial audit is 5 years from the next date of expiry and it is subjected to intermediate audit

-At present SMC audits are carried by IRS, the R.O of the Directorate. ISM Cell, DGS also carries out SMC audits as and when required especially sample ship audits.
The fee for the audit is to be submitted to DGS whenever DGS carries out SMC audits.
The procedure for nomination of auditors and conduct of SMC audits by DGS is as per Para B. IRS has to be contacted for their procedure.

SMC - Interim audit
Company in possession of Interim DOC or DOC is eligible to apply for Interim SMC audit for ship when Takes on responsibility for the operation of a ship (DOC should be relevant to the ship type) that is new to the company.
The application on company letterhead with following enclosures is to be submitted to ISM Cell, DGS and also to IRS (recognized organization)
(a) ISM - 03
(b) ISM - 01/02
(c) Copy of certificate of registry of the vessel

- On satisfactory completion of SMC audit, IRS issues short term Interim SMC valid for 3 months and recommends to ISM Cell, DGS for issuance of Interim SMC valid for 6 months.
- On receipt and scrutiny of audit reports received from IRS, an Interim SMC valid for 6 months is issued to the vessel so as the case when DGS carries out Interim SMC audits.
- In special cases ISM Cell extends the validity of an Interim SMC for a further period but not exceeding 6 months.

SMC - Initial audit:'
- Company in possession of DOC (not Interim DOC) and having implemented SMS on board the ship for at least 3 months is eligible to apply for Initial SMC audit of that ship.

Function 3

- The procedure for application, nomination of auditors and conduct of audit is as per Para D. On satisfactory completion of Initial SMC audit, IRS issues SMC valid for 5 months with recommendation to ISM Cell, DGS for issuance of SMC valid for a period not exceeding five years.

On scrutiny of audit report received from IRS, SMC valid for a period not exceeding 5 years is issued to the vessel so as when DGS carries out Initial SMC audit. This SMC is valid subject to at least one Intermediate verification, which should take place between second and third anniversary dates of the SMC.

SMC ' Intermediate Audit:
Company should apply for Intermediate SMC Audit of their vessel to maintain the validity of SMC. The Intermediate SMC Audit is required to be carried out between second and third anniversary dates of SMC.

The procedure for application, nomination of auditors and conduct of audit is as per Para D. Lead Auditor of the audit team endorses the SMC for Intermediate verification on satisfactory completion of audit.

SMC - Renewal Audit:
- Companies are required to apply for renewal verification audit before the expiry of validity of the existing SMC for obtaining fresh SMC, preferably when the window period commences i.e., within six moths prior to expiry of SMC.

- The procedure for application, nomination of auditors and conduct of audit is as per Para D.

- On satisfactory completion of Initial SMC audit, IRS issues SMC valid for 5 months with recommendation to ISM Cell, DGS for issuance of SMC valid for a period not exceeding five years.
- On scrutiny of audit report received from IRS, SMC valid for a period not exceeding 5 years is issued to the vessel so as when DGS carries out Initial SMC audit. This SMC is valid subject to at least one Intermediate verification, which should take place between second and third anniversary dates of the SMC.

Additional SMC Audits:
In case an Additional SMC audit is imposed by any RO or the Flag State surveyor, the concerned authority shall inform the same to the flag state promptly with clear reasons for the action. The FS may review the case and advise any RO or Administration auditor to undertake the additional audit based on the merit of the case.
In instances where the additional SMS assessment of a ship has been imposed by any Port State Control (PSC) authority, RO may board the said ship at the earliest opportunity to confirm that immediate corrective measures have been taken to facilitate prompt release of the vessel from the PSC intervention and thereafter shall forward a detailed report to the DGS, with clear recommendation for long term measures to avoid recurrence, viz. additional SMC audit, DoC audit, FSI inspection etc, as necessary.

By Anuj Kumar

Function 3

4. Ongoing Compliance
- Companies must undergo annual audits to maintain their DOC and SMC.
- Intermediate audits are required for SMCs between their second and third anniversaries.

ISM Audits & Survey
Company
Interim, Initial, Annual, Renewal, Additional audits, Surveillance audits

Ship:
Interim Audit, Initial audit, Intermediate audit, Renewal, Additional audit

Q. ISM Ammendment
2013 by resolution MSC.353(92), these amendments entered into force on 1 January 2015
PART A – IMPLEMENTATION
6 - RESOURCES AND PERSONNEL
The existing text of paragraph 6.2 is replaced with the following:
"6.2 The Company should ensure that each ship is: .
1. manned with qualified, certificated and medically fit seafarers in accordance with national and international requirements; and
2. appropriately manned in order to encompass all aspects of maintaining safe operations on board."

12- COMPANY VERIFICATION, REVIEW AND EVALUATION
The following new paragraph 12.2 is inserted after existing paragraph 12.1
"12.2 The Company should periodically verify whether all those undertaking delegated ISM-related tasks are acting in conformity with the Company's responsibilities under the Code."

Other provisions relevant to SOLAS chapter IX and the ISM Code include:
RESOLUTION MSC.428(98) (adopted on 16 June 2017)
MARITIME CYBER RISK MANAGEMENT IN SAFETY MANAGEMENT SYSTEMS
- RECOGNIZING the urgent need to raise awareness on cyber risk threats and vulnerabilities to support safe and secure shipping, which is operationally resilient to cyber risks,
- AFFIRMS that an approved safety management system should take into account cyber risk management in accordance with the objectives and functional requirements of the ISM Code;
- ENCOURAGES Administrations to ensure that cyber risks are appropriately addressed in safety management systems no later than the first annual verification of the company's Document of Compliance after 1 January 2021;

Function 3

SOLAS

Q. Contents of SOLAS

1) Chapter I - General Provisions
2) Chapter II-1 - Construction - Subdivision and stability, machinery and electrical installations
Chapter II-2 – Fire prevention, fire detection and fire extinction
3) Chapter III - Lifesaving appliances and arrangements
4) Chapter IV - Radio communications
5) Chapter V – Safety of Navigation
6) Chapter VI – Carriage of Cargoes
7) Chapter VII – Carriage of Dangerous Goods
8) Chapter VIII - Nuclear ships
9) Chapter IX - Management for the Safe Operation of Ships
10) Chapter X – Safety measures for high-speed craft
11) Chapter XI-1 - Special measures to enhance maritime safety
Chapter XI-2 - Special measures to enhance maritime security
12) Chapter XII - Additional security measures for bulk carriers
13) Chapter XIII – Verification of compliance
14) Chapter XIV - Safety measures for ships operating in polar waters.
15) Chapter XV - Safety Measures For Ships Carrying Industrial Personnel

Trick to Remember
Great Captain Leads Reliable Ships,
Carefully Crossing New Maritime Seas,
Safely And Vigilantly Safe Sailing

Q. Amendments to SOLAS

A set of amendments to the International Convention for the Safety of Life at Sea (SOLAS) and the associated Codes enter into force on 1 January 2024.
Amendments to the technical provisions generally follow a four-year cycle of entry into force. This news highlights amendments related to:
- Safe mooring operations
- Modernization of the GMDSS
- Watertight integrity
- Watertight doors on cargo ships
- Fault-isolation of fire detection systems
- Life-saving appliances
- Safety of ships using LNG as fuel

Safe mooring operations

New SOLAS requirements intend to improve mooring safety by introducing additional requirements to selection, arrangement, inspection, maintenance and replacement of mooring equipment, including lines.

Function 3

Documentation regarding the design of mooring arrangements and the selection of mooring equipment will be required to be provided and kept on board.

The new requirements are incorporated in SOLAS Regulation II-1/3-8 on towing and mooring equipment, and supported by the following guidelines:

Guidelines on the design of mooring arrangements and the selection of appropriate mooring equipment and fittings for safe mooring" (MSC.1/Circ. 1619)
"Guidelines for inspection and maintenance of mooring equipment including lines" (MSC.1/Circ.1620)
"Revised guidance on shipboard towing and mooring equipment" (MSC.1/Circ. 1175/Rev.1)
The design requirements will apply to new cargo and passenger ships constructed on or after 1 January 2024 that are above 3000 GT, and should also apply to ships of 3000 GT and below as far as reasonably practicable. The maintenance and inspection requirements will be applied retroactively for all ships.

Modernization of the Global Maritime Distress and Safety System
The requirements to the Global Maritime Distress and Safety System (GMDSS) have been modernized to contain more generic requirements, independent of specific service providers, and to remove carriage requirements for obsolete systems. Furthermore, the requirements for communication equipment have been moved from SOLAS Chapter III on life-saving appliances to Chapter IV on radio communications. The definitions of the sea areas A1 to A4 have been amended to reflect that the geographical area of coverage may vary between various satellite service providers.

The amendments will enter into force on 1 January 2024. Existing SOLAS certificates do not have to be reissued before they expire as a consequence of the reorganization of SOLAS Chapters III and IV.

Watertight integrity
Amendments to SOLAS Chapter II-1 will ensure that the requirements to watertight integrity in parts B-2 to B-4 capture the probabilistic damage stability approach in parts B and B-1. The amendments address inter alia assumptions regarding progressive flooding, valves in the collision bulkhead and the consideration of watertight doors.

The amendments will apply to new cargo and passenger ships constructed on or after 1 January 2024 and will not have any impact on existing ships.

Watertight doors on cargo ships
The requirements to watertight doors in MARPOL Annex I, the Load Lines Convention, the IBC Code and the IGC Code have been amended to harmonize the consideration of watertight doors in damage stability calculations with the same in SOLAS. The inconsistencies were related to the type of watertight doors (sliding, hinged), to the technical/ operational requirements and to the terminology for the frequency of use of watertight doors.

By Anuj Kumar

Function 3

The amendments to the Load Lines Convention and the IBC Code will enter into force on 1 January 2024, and the amendments to MARPOL Annex I and the IGC Code will enter into force on 1 July 2024. The amendments will apply to cargo ships and will not have any impact on existing ships.

Fault isolation of fire detection systems

The requirements for fire detection systems have been adjusted so that short circuit isolators do not need to be provided at each individually identifiable fire detector for cargo ships and passenger ship balconies. For cargo ships, one short circuit isolator per deck will typically be acceptable.

The amendments to Chapter 9 of the Fire Safety Systems (FSS) Code will enter into force on 1 January 2024.

Q. Amendment to chapter 3 solas.

Life-saving appliances

Various adjustments have been made to SOLAS Chapter III and the associated Life-Saving Appliances (LSA) Code:

The launching appliance of new rescue boats less than 700 kg does not need to have stored mechanical power, but handling shall be possible by one person.

Free-fall lifeboats will not need to be launch-tested with the ship making headway at speeds of up to 5 knots in calm water, as there are no additional dynamic loads on the launching arrangements.

Lifeboats equipped with two independent propulsions systems do not need to be equipped with buoyant oars.

The amendments will apply to cargo and passenger ships and enter into force on 1 January 2024. Flag states are invited to voluntarily apply the launch test provisions for free-fall lifeboats earlier.

Ships using LNG as fuel

The International Code for Safety for Ships using Gases or other Low-flashpoint Fuels (IGF Code) has been amended to reflect experiences gained since the code entered into force in 2017. The main amendments address:

Cofferdams for fire protection purposes (Chapter 6.7)

Safe fuel distribution outside machinery spaces (Chapter 9)

Fire protection between spaces with fuel containment systems (Chapter 11)

Fixed fire-extinguishing systems in LNG fuel preparation spaces (Chapter 11)

The amendments will apply to new ships using natural gas as fuel and will enter into force on 1 January 2024.

What is Chapter 9 of solas?

Adopted as part of the 1994 amendments to SOLAS, Chapter IX mandates compliance with the International Safety Management (ISM) Code, which was developed to enhance safety management practices in shipping.

Chapter IX consists of six regulations that outline the requirements for safety management:

Function 3

Regulation 1: Definitions - Provides definitions for key terms used in the chapter.
Regulation 2: Application - Specifies which ships are subject to the provisions.
Regulation 3: Safety Management Requirements - Mandates the establishment of a Safety Management System (SMS) that includes policies for safety and environmental protection.
Regulation 4: Certification - Outlines the certification process for compliance with the ISM Code.
Regulation 5: Maintenance of Conditions - Requires ongoing maintenance of compliance with safety management practices.
Regulation 6: Verification and Control - Details procedures for verifying compliance with the ISM Code.

The chapter applies to various types of ships, including:
- Passenger ships (including high-speed craft).
- Oil tankers, chemical tankers, gas carriers, bulk carriers, and cargo high-speed craft of 500 gross tonnage (GT) and above.
- Other cargo ships and mobile offshore drilling units of 500 GT and above, with specific compliance dates ranging from July 1998 to July 2002 depending on the vessel type.

What is Solas ch 12

Chapter XII of SOLAS, titled Additional Safety Measures for Bulk Carriers, was introduced to enhance the safety of bulk carriers following several incidents in the 1990s.
Adopted in November 1997 by the International Maritime Organization (IMO), Chapter XII was a response to safety concerns regarding bulk carriers, particularly after the sinking of several vessels.

The regulations apply primarily to bulk carriers over 150 meters in length and focus on enhancing structural integrity, stability, and operational safety.

Chapter XII consists of 14 regulations, which cover various safety aspects:
- Damage Stability Requirements (Regulation 4):
Ensures that bulk carriers maintain stability under adverse conditions, particularly after sustaining damage.
- Structural Strength (Regulation 5):
Specifies criteria for the structural strength of hulls to ensure robustness against operational stresses.
- Structural and Other Requirements (Regulation 6):
Addresses requirements related to hatch covers, ballast systems, and cargo hold design to enhance overall safety.
- Survey and Maintenance (Regulation 7):
Mandates regular inspections and maintenance of bulk carriers to uphold safety standards.
- Compliance Information (Regulation 8):
Requires documentation that demonstrates adherence to the chapter's regulations.
- Special Cases (Regulation 9):
Provides guidelines for bulk carriers that cannot meet specific stability requirements due to design constraints.
- Solid Bulk Cargo Density Declaration (Regulation 10):
Ensures accurate information regarding the density of solid bulk cargoes is declared.

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- Loading Instrument (Regulation 11):
Mandates the use of loading instruments to facilitate proper loading calculations and ensure stability during operations.
- Alarms (Regulation 12):
Requires monitoring systems for water ingress and other critical conditions that could compromise safety.
- Pumping Systems (Regulation 13):
Ensures that efficient pumping systems are available for cargo handling and emergency situations.
- Hold Empty Restrictions (Regulation 14):
Prohibits sailing with empty holds, which can adversely affect stability.

Q. Ch.11-2 of solas.

Chapter XI-2 of SOLAS, titled Special Measures to Enhance Maritime Security
The chapter applies to all ships engaged in international voyages and port facilities used by these ships. It mandates specific security measures and responsibilities for ship operators, companies, and contracting governments.

Chapter XI-2 consists of 13 regulations that outline various obligations and requirements:
- Regulation 1: Definitions:
Provides definitions for key terms used throughout the chapter, such as "ship," "company," and "security."
- Regulation 2: Application:
Specifies which vessels and facilities are subject to the provisions of this chapter.
- Regulation 3: Obligations of Contracting Governments:
Mandates governments to set security levels and provide guidance on protective measures against security incidents.
- Regulation 4: Requirements for Companies and Ships:
Outlines the responsibilities of companies in ensuring their ships comply with security measures.
- Regulation 5: Specific Responsibility of Companies:
Details the specific duties of companies regarding security management.
- Regulation 6: Ship Security Alert System (SSAS):
Requires ships to have a system in place that can alert authorities in case of a security threat.
- Regulation 7: Threats to Ships:
Addresses potential threats that ships may face and outlines necessary preventive measures.
- Regulation 8: Master's Discretion for Ship Safety and Security:
Confirms the master’s authority to make decisions regarding safety and security without undue pressure from owners or charterers.
- Regulation 9: Control and Compliance Measures:
Establishes procedures for enforcement and compliance checks related to security measures.
- Regulation 10: Requirements for Port Facilities:
Specifies security requirements for port facilities, ensuring they align with those of the ships they serve.
- Regulation 11: Alternative Security Agreements:

Function 3

Allows for alternative agreements between parties as long as they meet or exceed the ISPS Code requirements.

- Regulation 12: Equivalent Security Arrangements:

Permits equivalent arrangements that provide similar levels of security as prescribed by the chapter.

- Regulation 13: Communication of Information:

Mandates effective communication between ships, port facilities, and contracting governments regarding security issues.

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Function 3

STCW

Q. STCW what it Contains

The STCW Convention, or the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, was established to set minimum qualification standards for seafarers globally

The primary goal of the STCW Convention is to ensure that seafarers are adequately trained and certified to perform their duties safely and effectively, thereby enhancing maritime safety and protecting the marine environment

Minimum Standards:
The STCW sets minimum standards for training, certification, and watchkeeping that countries must meet or exceed. This includes requirements for various roles on board ships, such as masters, officers, and watch personnel.

Structure of the Code:
The STCW Code is divided into two parts:
Part A: Contains mandatory provisions that member states must implement.
Part B: Provides recommended guidance to assist parties in implementing the convention effectively.
part A, mandatory provisions to which specific reference is made in the annex to the STCW Convention and which give, in detail, the minimum standards required to be maintained by Parties in order to give full and complete effect to the provisions of the STCW Convention;

part B, recommended guidance to assist Parties to the STCW Convention and those involved in implementing, applying or enforcing its measures to give the STCW Convention full and complete effect in a uniform manner

Q. STCW Convention chapters

Chapter I: General provisions
Chapter II: Master and deck department
Chapter III: Engine department
Chapter IV: Radiocommunication and radio operators
Chapter V: Special training requirements for personnel on certain types of ships
Chapter VI: Emergency, occupational safety, security, medical care and survival functions
Chapter VII: Alternative certification
Chapter VIII: Watchkeeping

Q. Chapter 8 of Stcw what does it Contain

Chapter VIII of the STCW Annex, and the associated sections of the STCW Code, are a consolidation of material relating to watchkeeping arrangements. The primary focus of the STCW convention is to ensure that an effective watch is maintained on all seagoing ships, by qualified and fit personnel under all circumstances

Function 3

Regulation VIII/1: Fitness for Duty Ensure watchkeeping personnel are not impaired by fatigue
Regulation VIII/2: Certification of Seafarers Ensure watchkeeping personnel meet certification requirements and follow safe watchkeeping practices.

4 Parts:
Part 1: Certification
Officers in charge of navigational and engineering watches must be qualified (Chapters II, III, or VII).

Part 2: Voyage Planning
Prepare voyage plan before commencement.

Part 3: Watchkeeping at Sea
3-1: Navigational Watch
Emphasis on lookout responsibilities.
Bridge resource management principles.
3-2: Engineering Watch
Engine room operations and monitoring.
3-3: Radio Watch
Communication and safety responsibilities.

Part 4: Watchkeeping in Port

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Function 3

Chain Register / DLR

Q. Chain Register & Contents

A record of the particulars of test and examination of lifting appliances, loose gear and heat (annealing) should be entered and maintained in the register of machinery, chains, wire ropes etc. called the Chain Register.

Certificates

The certification forms to be used in conjunction with this Register (Form No. 1) are as follows:
Form I - Identity of National Authority or Competent Organisation

Name of Ship	Name of Owner
Official Number	Register Number
Call Sign	Date of Issue
Port of Registry	Issued by
	Signature and Stamp

Form No. 2 – Certificate of test and thorough examination of lifting appliances.
Form No. 2 (U) – Certificate of test and thorough examination of derricks used in union purchase.
Form No. 3 – Certificate of test and thorough examination of loose gear.
Form No. 4 – Certificate of test and thorough examination of wire rope.

Divided into 3 Parts
Part 1: Records initial and periodic load tests of lifting appliances and their annual thorough examinations.
Part 2: Details initial and periodic load tests of loose gear and their annual thorough examinations.
Annealing Records: Documents the heat treatment processes for chains, rings, hooks, shackles, and swivels (with certain exemptions) to ensure their integrit

Initial examination and certification
1.1 Every lifting appliance shall be certified by a competent person before being taken into use for the first time to ensure that it is of good design and construction and of adequate strength for the purpose of which it is intended.
1.2 Before being taken into use for the first time a competent person shall supervise and witness testing, and shall thoroughly examine every lifting appliance.
1.3 Every item of loose gear shall, before being taken into use for the first time be tested, thoroughly examined and certified by a competent person inaccordance with national law or regulations.
1.4 Upon satisfactory completion of the procedures indicated above the competent person shall complete and issue the Register of Lifting Appliances and attach the appropriate Certificates.
An entry shall be made in Part I of the Register.
The register and certificates shall be kept on board the ship and produced on demand to an inspector. They shall be retained for at least five years after the date of the last entry.

Periodic examinations and re-testing

Function 3

2.1 All lifting appliances and every item of loose gear shall be thoroughly examined by a competent person at least once in every 12 months. The particulars of these thorough examinations shall be entered in Part I of the Register.
2.2 Re-testing and thorough examination of all lifting appliances and every item of loose gear is to be carried out:
(a) after any substantial alteration or renewal, or after repair of any stress bearing part; and
(b) in the case of lifting appliances at least once in every five years.

2.3 The re-testing referred to in paragraph 2.2 (a) may be omitted provided the part which has been renewed or repaired is subjected by separate test, to the same stress as would have been imposed on to it if it had been tested in situ during testing of the lifting appliance.
2.4 The thorough examinations and tests referred to in paragraph 2.2 are to be entered in Part I of the Register.
2.5 No new item of loose gear shall be manufactured of wrought iron. Heat treatment of any existing wrought iron components should be carried out to the satisfaction of the competent person. No heat treatment should be applied to any item of loose gear unless the treatment is in accordance with the manufacturer's instruction; to the satisfaction of the competent person. Any heat treatment and the associated examination are to be recorded by the competent person in Part I of the Register.

Q. Under which convention of ILO chain register is required

Article 25(2) of the Occupational Safety and Health (Dock Work) Convention, 1979 (No. 152), requires that "a register of the lifting appliances and items of loose gear shall be kept in a form prescribed by the competent authority, account being taken of the model recommended by the International Labour Office".

Q. Entries in Chain Register and who makes it

Competent Person
The primary responsibility for making entries in the Chain Register lies with a competent person—an individual with the necessary expertise and authority to conduct inspections and testing

Q. Chain Register Part 1 and 2

Q. Contents of Chain Register part 2

PART I – Thorough examination of lifting appliances and loose gear
1. Situation and description of lifting appliances and loose gear (with Distinguishing number or marks, if any) which have been thoroughly examined.
2. Certificate Nos
3. Examination performed (see Note 2)
4. I certify that on the date below, I thoroughly examined the gear listed in column (1) and found no defects affecting its safe working condition, except those noted in column (5).
5. Remarks (To be dated and signed)

Function 3

Note 1: If all the lifting appliances are thoroughly examined on the same date it will be sufficient to enter in column (1) “All lifting appliances and loose gear”. If not, the parts which have been thoroughly examined on the dates stated must be clearly indicated.

Note 2: The thorough examinations to be indicated in column (3) include:
(a) Initial
(b) 12 monthly
(c) Five yearly
(d) Repair/damage
(e) Other thorough examinations including those associated with heat treatment.

PART II – Regular inspections of loose gear
1. Situation and description of loose gear (with distinguishing number or mark, if any) which has been inspected (see Note 1)
2. Signature and date of the responsible person carrying out the inspection
3. Remarks (To be dated and signed)

Note 1: All loose gear should be inspected before use. However, entries need only be made when the inspection discloses a defect.

Annealing
In metallurgy and material science, annealing is a heat treatment that alters the physical and sometimes chemical properties of a material to increase its ductility and reduce its hardness making it more workable.
It involves heating a material above its re-crystallization temperature, maintaining a suitable temperature for an appropriate amount of time and then cooling it slowly.
Annealing also relieves any internal stresses which may be present in the metal.

General Requirements:
All equipment (except bridle chains attached to derricks) must be annealed under supervision.
Annealing intervals:
12.5 mm and smaller equipment: every 6 months.
Larger equipment: every 12 months.

Exceptions:
Hand-operated cranes and hoisting appliances:
12.5 mm and smaller equipment: every 12 months.
Larger equipment: every 2 years.

Q. Where will you make an entry regarding the test (Chain register)
A record of these regular inspections is to be entered in part II of the Register, but entries need only be made when the inspection has indicated a defect in the item. Chief Officer or

more commonly Chief Engineer may be the 'Responsible Officer' deputed by Master.

Q. Reg 41 and schedule 1 as per dock labour act 46 in detail

Reg 41.- Test and periodical examination of lifting appliances.-

1. Before being taken into use for the first time or after It has undergone any alternations or repairs liable to affect its strength or stability and also once at least in every five years, all lifting appliances including all parts and gears thereof, whether fixed or moveable, shall be tested and examined by a competent person in the manner set out In Schedule I.
2. All lifting appliances shall be thoroughly examined by a competent person once atleast In every 12 months. Where the competent person making this examination forms the opinion that the lifting appliance cannot continue to function safely, he shall forthwith give notice in writing of his opinion to the owner of the lifting appliance or in case of lifting appliance carried on board a ship not registered in India, to the Master of the ship or officer-in-charge of the ship.
3. Thorough examination for the purpose of this regulation shall mean a visual examination, supplemented if necessary by other means such as **hammer test**, carried out as carefully as the conditions permit, in order to arrive at a reliable conclusion as to the safety of the parts examined; and if necessary for this purpose, parts of the lifting appliance and gear, shall be dismantled.

46. Construction and maintenance of loose gears.-

(1) Every loose gear shall be-

(a) of good design and construction, sound material and adequate strength for the purpose for which it is used and free from patent defects and,

(b) properly maintained in good repair and working order.

(2) Components of the loose gear shall be renewed if one of the dimensions at any point has decreased by 10 per cent. or more by user.

(3) (a) Chains shall be withdrawn from use when stretched and increased in length exceeds five per cent, or when a link of the chain deformed or otherwise damaged or raised scarfs of defective welds appeared.

(b) Rings hooks, swivels and end links attached to chains shall be of the same material as that of the chains.

(4) The voltage of electric supply to any magnetic lifting device shall not fluctuate by more than + 10 per cent.

Reg 48. Ropes.-

(1) No rope shall be used for dock work unless:-

a) it is of suitable quality and free from patent defect, and

b) in the case of wire rope, it has been tested and examined by a competent person in the manner set out in Schedule I.

(2) Every wire rope of lifting appliance or loose gear used in dock work shall be inspected by a responsible person once at least in every three months, provided that after any wire has broken in such rope, it shall be inspected once at least in every month.

(3) No wire rope shall be used in dock work if in any length of eight diameters the total number of visible broken wires exceed 10 percent of the total number of wires or the rope shows sign of

excessive wear, corrosion or other defects which in the opinion of the person who inspects it or Inspector, renders it as unfit for use.

Schedule I

Lifting appliances . - Every lifting appliance with its accessory gear, shall be subjected to a test load which shall exceed the safe working load (SWL) as specified in the following table: -

Table

Safe Test load.	Test load.
Up to 20 tonnes	25 percent in excess of safe working load.
20 to 50 tonnes	5 tonnes in excess of safe working load
Over 50 tonnes.	10 percent in excess of safe working load

Lifting gear 25 percent in excess of safe working load. 5 tonnes in excess of safe working load 10 percent in excess of safe working load . -

(a) Every ring, hook, chain, shackle, swivel, eye- bolt, plate clamp, triangular plate or pulley block except single sheave block shall be subjected to a test load which shall not be less than the load as specified in the following table: -

Table

Safe Working Load(in tonnes)	Test load (in tonnes)
Up to 25	2x safe working load
above 25	(1.22 x safe working load) + 20

B) In case of a single sheave block, the safe working load shall be the maximum load which can safely be lifted by the block when suspended by its head fitting and the load is attached to a rope which passes around the sheave of the block and a test load not less than four times the proposed safe working load shall be applied to the head of the block.

C) In the case of a multi sheave block the test load shall not be less than the Load as specified in the following table: -

Table

Safe Working Load(in tonnes)	Test load (in tonnes)
Up to 25	2x safe working load
above 25	2x safe working load
25 to 16o	(0.9933 x safe working load) + 27
above 160	1.1 x safe working load.

(D)In the case of hand- operated pulley blocks used with pitched chains and rings, hooks, shackles or swivels, permanently attached thereto, a test load not less than 50 per cent in excess of safe working load shall be applied.

(e) In the case of a pulley block fitted with a bucket, the bucket shall be tested and the load applied to the bucket when testing that block will be accepted as test load of the bucket.

Function 3

(f) In the case of a sling having two legs, the safe working load shall be calculated when the angle between the legs is 90 degree. In case of multi- legged slings the safe working load shall be calculated as per national standards.
(g) Every lifting beam lifting frame, container spreader, buckets tub, or other similar devices shall be subjected to a test load which shall not less than the load as specified in the following: -

TABLE

Safe Working Load(in tonnes)	Test load (in tonnes)
Up to 10	2x safe working load
10 to 160	(1.04)x safe working load)+ 9.6
above 160	1.1x safe working load.

h) Wire ropes: In the case of wire ropes a sample shall be tested to destruction. The test procedure shall be in accordance with an international or recognised national standard. The safe working load of the rope is to be determined by dividing the load at which the sample broke by a co-efficient of utilization determined as follows.
i) Before any test is carried out, a visual inspection of the lifting appliance, or loose gear involved shall be conducted and any visible defective gear shall be replaced or renewed.
j) After being tested all the loose gears shall be examined to see whether any part have been injured or permanently deformed by the test.

Q. Condition for discarding a wire rope

1. Visible Broken Wires:
If the number of visible broken wires exceeds 10% of the total number of wires in any length equivalent to eight diameters of the rope.
For rotation-resistant ropes, if there are more than 2 broken wires over a length of 6d or 4 broken wires over 30d.

2. Diameter Reduction:
A reduction in rope diameter greater than 7% of the nominal rope diameter (NRD) due to external wear.
For rotation-resistant ropes, a reduction greater than 3%, and for other ropes, greater than 10% due to reasons other than external wear.

3. Concentration of Broken Wires:
If there is a concentrated group of broken wires in a length of 6d or if there are more than 4% broken wires in all outer strands over a length of 30d.

4.Internal Damage Indicators:
Wire breaks in the strand valley indicate internal deterioration; two or more valley breaks in a length of 6d necessitate discard.
Localized core or strand protrusion, collapse of the core, or complete fracture of one strand.

5. Corrosion and Wear:

Function 3

Severe corrosion or pitting on the wire surface, which may compromise its integrity.
Signs of excessive wear that render the rope unfit for use.

6. Deformation and Damage:
Localized distortion, damage (crushing, kinking), or birdcage formation.
Evidence of plastic damage, such as considerable wear or surface embrittlement.

7. Heat Damage:
Exposure to high temperatures or heat from fire can compromise wire strength; such ropes should be discarded if affected.

Q. How will u test a lifting appliance? What all checks to be carried out on lifting gear annually.

1. Every lifting appliance shall be tested with a test load which shall exceed the safe working load (SWL) as follows:

SWL	Test load
Up to 20 tonnes	25 per cent in excess
20 to 50 tonnes	5 tonnes in excess
Over 50 tonnes	10 per cent in excess

2. In the case of derrick systems the test load shall be lifted with the ship's normal tackle with the derrick at the minimum angle to the horizontal for which the derrick system was designed (generally 15 degrees), or at such greater angle as may be agreed. The angle at which the test was made should be stated in the certificate of test. After the test load has been lifted it should be swung as far as possible in both directions.
2.1 The SWL shown is applicable to swinging derrick systems only. When derricks are used in union purchase the SWL (U) is to be shown on Form 2 (U).
2.2 In the case of heavy derricks, care should be taken to ensure that the appropriate stays are correctly rigged.

3. In the case of cranes, the test load is to be hoisted, slewed and luffed at slow speed. Gantry and travelling cranes together with their trolleys, where appropriate, are to be traversed and travelled over the full length of their track.
3.1 In the case of variable load-radius cranes, the tests are generally to be carried out with the appropriate test load at maximum, minimum and at an intermediate radius.
3.2 In the case of hydraulic cranes where limitations of pressure make it impossible to lift a test load 25 per cent in excess of the safe working load, it will be sufficient to lift the greatest possible load, but in general this should not be less than 10 per cent in excess of the safe working load.

4. As a general rule, tests should be carried out using test loads, and no exception should be allowed in the case of initial tests. In the case of repairs, replacement or when the periodic examination calls for re-test, consideration may be given to the use of spring or hydraulic balances provided the SWL of the lifting appliance does not exceed 15 tonnes. Where a spring or hydraulic balance is used it shall be

calibrated and accurate to within ±2 per cent and the indicator should remain constant for five minutes.
4.1 If test weights are not used this is to be indicated in column (3).

What is static and dynamic test in respect of lifting appliances?
What is given in the chain register regarding testing of Crane
How to go about testing the crane of 20 T.
15 T SWL crane proof load? 22 T crane proof load?
How much proof load?

Static Test

To verify the structural integrity of the crane and its components.
A load 25% greater than the crane's rated capacity is applied.
The load is lifted to a height of 100 to 200 mm and held for a minimum of 10 minutes.
After this period, the load is lowered, and the crane is examined for any deformations or damages.
The test is considered successful if there are no visible cracks, permanent deformations, or damage affecting the crane's functionality.

Dynamic test

To assess the operational performance of crane mechanisms and brakes under working conditions.
A load exceeding the rated capacity by 10% is used during testing.
The crane undergoes various operations, including hoisting, lowering, and swinging, to simulate normal working conditions.
All limit switches and safety cut-offs are tested.
Successful dynamic testing requires that all mechanisms function correctly without any damage or loosening of connections during operations.

Who approves lifting gears?

Lifting gears are approved by a competent person or competent authority, as defined by relevant regulations and standards.

Competent Person
A competent person is someone with the necessary technical knowledge and experience to assess lifting equipment.
They are responsible for:
- Conducting thorough examinations of lifting appliances before they are put into use for the first time.
- Supervising and witnessing testing to ensure compliance with safety standards.
- Issuing certificates that confirm the equipment's design, construction, and adequacy for its intended purpose.

Competent Authority
- A competent authority refers to a government body or regulatory agency empowered to enforce safety regulations and standards.

Function 3

They oversee:
- The certification process for lifting equipment.
- Compliance with international standards, such as those set by the International Labour Organization (ILO) and other relevant bodies

How to carry out hammer test and what type of hammer?

Purpose of the Hammer Test
Evaluate Material Condition: It helps in detecting internal flaws, wear, or damage in lifting equipment that may not be visible through standard visual inspections.
Ensure Safety: By confirming that equipment meets safety standards, it minimizes risks associated with equipment failure during operation.

Methodology
- The test involves striking the equipment with a hammer and observing the response. The sound produced and the rebound characteristics can indicate the condition of the material.
- A competent person conducts this test, analyzing factors such as:
Sound quality (a clear sound may indicate good material integrity).
Rebound height (higher rebounds suggest less internal damage).

Rebound Hammer
- The rebound hammer consists of a spring-driven mass that impacts the surface of the material being tested. It measures the rebound distance after impact, which correlates to the hardness and integrity of the material.
- Before use, the hammer is calibrated against a steel anvil to ensure accurate readings. The anvil has a high hardness value, providing a reliable standard for calibration.

Types of Hammers Used
1. Schmidt Hammer:
This is the most common type of rebound hammer used in concrete testing but can also be applied in assessing lifting equipment materials. It measures rebound values that indicate surface hardness.
2. Impact Hammers:
Some applications may use different types of impact hammers designed for specific materials or conditions, but they all follow similar principles of measuring rebound or impact resistance.

Authorised person" means a person authorised by the employer, the master of the ship or a responsible person to undertake a specific task or tasks and possessing necessary technical knowledge and experience for undertaking the task or tasks;

Competent person" means. a person belonging to a testing establishment in India who is approved by the Chief Inspector for the purpose of testing, examination or annealing and certification of lifting appliances, loose gears or wire ropes;

Powers of Inspectors.-

Function 3

(a) An Inspector may at any port for which he is appointed.-
(i) enter, with such assistance, (if any), as he thinks fit, any ship, dock, warehouse or other premises, where any dock work, is being carried on, or where he has reason to believe that any dock work is being carried on;
(ii) make examination of the ship, dock, lifting appliance, loose gear, lifting device, staging, transport equipment, warehouse or other premises, used or to be used, for any dock work;
(iii) require the production of any testing muster roll or other document relating to the employment of dock workers and examine such document;
(iv) take on the spot or otherwise such evidence of any person which he may deem necessary: Provided that no person shall be compelled under sub-regulation 3 (a) (iv) to answer any question or, give any evidence tending to incriminate himself;
(v) take copies of registers, records or other documents or portions thereof as he may consider relevant in respect of any offence which he has reason to believe has been committed or for the purpose of any inquiry;
(vi) take photograph, sketch, sample, weight measure or record as he may consider necessary for the purpose of any examination or inquiry;
(vii) hold an inquiry into the cause of any accident or dangerous occurrence which he has reason to believe was the result of the collapse or failure of any lifting appliance loose gear, transport equipment, staging non-compliance with any of the provisions of the Act or the regulations;
(viii) issue show-cause notice relating to the safety, health and welfare provisions arising under the Act or the regulations;
(ix) prosecute, conduct or defend before any court any complaint or other proceedings, arising under the Act or the regulations;
(x) direct the port authority, dock labour board and other employers of dock workers for getting the dock workers medically examined if considered necessary.

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Function 3

Q. Sua convention - Convention for the Suppression of Unlawful Acts Against the Safety of Maritime Navigation

The SUA Convention and the Protocol was adopted in 1988 and entered into force in 1992.
The main purpose of the Convention is to ensure that appropriate action is taken against persons committing unlawful acts against ships.

The unlawful acts or offences include;
a) the seizure of ships by force;
b) acts of violence against persons on board ships; and
c) placing of devices on board a ship which are likely to destroy or damage it.

The Convention requires Contracting Governments either to prosecute the person for committing any of the offence, or to hand over the individual to another State which has requested his/her extradition for the same crime.

The amendments to the 1988 Convention were adopted in the form of Protocols to the SUA treaties (the 2005 Protocols). The 2005 Protocol came into force in 2010 and added to the list of offence.

It stated that a person commits an offence within the meaning of the Convention if that person unlawfully and intentionally:
a) intimidates a population, or compels a Government or an international organization to do or to abstain from any act.
b) uses against or on a ship or discharging from a ship any explosive, radioactive material or BCN (biological, chemical, nuclear) weapon in a manner that causes or is likely to cause death or serious injury or damage;
c) discharges, from a ship, oil, liquefied natural gas, or other hazardous or noxious substance, in such quantity or concentration that causes or is likely to cause death or serious injury or damage;
d) uses a ship in a manner that causes death or serious injury or damage;
e) transports on board a ship any explosive or radioactive material, knowing that it is intended to be used to cause death or serious injury or damage.
f) transports on board a ship any BCN weapon, knowing it to be a BCN weapon;

It is also an offence to unlawfully and intentionally,
a) injure or kill any person while committing any of the offences,
b) to attempt to commit an offence,
c) to participate as an accomplice;
d) to organize or direct or force others to commit an offence;
e) to contribute in any way to the offence.
Also, a person commits an offence within the meaning of the Convention if that person unlawfully and intentionally transports another person on board a ship knowing that the person has committed an act that constitutes an offence under the SUA Convention or an offence set forth in
any treaty listed in the Annex. The Annex lists nine such treaties.

By Anuj Kumar

Function 3

The Convention also covers the roles and responsibilities of the master of the ship, flag State and receiving State in delivering to the authorities of any State Party, any person believed to have committed an offence under the Convention, including the furnishing of evidence pertaining to the alleged offence.

By Anuj Kumar

Function 3

Q. Hong Kong Convention

The Hong Kong Convention refers to the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, adopted in May 2009. It aims to improve safety and environmental standards in ship recycling practices, particularly addressing the hazardous materials found in ships at the end of their operational lives.

The primary goals of the Hong Kong Convention include:
Enhancing Safety: Protecting human health and the environment during the ship recycling process.
Inventory of Hazardous Materials (IHM): Ships over 500 gross tonnage must maintain an IHM that details hazardous materials on board, ensuring proper management during recycling.

Structure
The convention outlines several key components:
Part I: Lists hazardous materials contained in the ship's structure and equipment.
Part II: Covers operationally generated wastes that may be hazardous.
Part III: Includes consumable goods that could contain hazardous materials.

Compliance Requirements
Surveys: Ships must undergo initial, renewal, and final surveys to verify compliance with the IHM requirements.
Ship Recycling Facility Plan: Recycling facilities must develop a plan that meets safety and environmental standards before being authorized to operate.

Q. What is green passport and IHM.

Q. Green passport, who issues

The Green Passport was an initiative introduced by the International Maritime Organization (IMO) to promote environmentally sound ship recycling practices. It served as a certificate that documented the presence of hazardous materials on board a vessel

The primary aim of the Green Passport was to ensure that shipowners provided information about hazardous materials, such as asbestos, lead, and polychlorinated biphenyls (PCBs), to facilitate safe recycling at the end of a ship's life.

The green passport will be delivered by the shipyard during the construction and it will be later updated with all the changes made to the ship during its lifetime.

The concept of the Green Passport has been largely replaced by the IHM under the Hong Kong Convention and the EU Ship Recycling Regulation (EU SRR). As such, it is now considered obsolete for new regulations.

Inventory of Hazardous Materials (IHM)

Function 3

The IHM is a comprehensive document that identifies and quantifies all hazardous materials present on a ship. It covers materials used in construction, equipment, and systems throughout the vessel's lifecycle.

The IHM aims to ensure that hazardous materials are properly managed during a ship's operational life and when it is decommissioned. It is essential for minimizing environmental impact and protecting human health during ship recycling.

The IHM is mandated by the Hong Kong Convention for the Safe and Environmentally Sound Recycling of Ships (2009) and the EU SRR (2013). Ships over 500 gross tonnage must have an IHM in place to operate legally.

The Green Passport served as a precursor to the IHM. While it provided valuable information about hazardous materials, it lacked the comprehensive framework established by the IHM.
Ships previously issued a Green Passport must convert this documentation into an IHM to comply with current regulations. This process involves conducting a gap analysis to ensure all requirements under the Hong Kong Convention and EU SRR are met.

The IHM has following parts:
· Materials contained in ship structure or equipment
· Operationally generated wastes, and
· Stores

The IHM Part I shall be prepared and certified for new ships and ships in operation and shall be maintained and kept up to date during the operational life of the ship, while
The IHM Part II & III are only required to be prepared when the ship is decided to be sent for recycling.

For the preparation of IHM Part I, hazardous materials set out in appendix 1 and 2 of the HKC or Annex I and II of the EU SRR shall be investigated.
IHM Part I for new ships should be developed at the design and construction stage based on suppliers' declarations on hazardous material content of the products. The determination of hazardous materials present on board existing ships should, as far as practicable, be conducted as prescribed for new ships.

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Function 3

Q. What is an international maritime organization?

The International Maritime Organization (IMO) is a specialized arm of the UN. IMO is tasked with enhancing global shipping, ensuring security and safety, and guarding against ship-related ocean pollution

The IMO ensures global shipping safety and security. The United Nations formed the IMO after the 1948 Geneva Accord

the IMO has 175 member nations and 3 associate members.

The Organization consists of an Assembly, a Council and five main Committees.

Assembly

This is the highest Governing Body of the Organization. It consists of all Member States and it meets once every two years in regular sessions, but may also meet in an extraordinary session if necessary. The Assembly is responsible for approving the work programme, voting the budget and determining the financial arrangements of the Organization. The Assembly also elects the Council.

Council

The Council is elected by the Assembly for two-year terms beginning after each regular session of the Assembly.

The Council is the Executive Organ of IMO and is responsible, under the Assembly, for supervising the work of the Organization. Between sessions of the Assembly the Council performs all the functions of the Assembly, except the function of making recommendations to Governments on maritime safety and pollution prevention which is reserved for the Assembly by Article 15(j) of the Convention.

Other functions of the Council are to:

1. coordinate the activities of the organs of the Organization;
2. consider the draft work programme and budget estimates of the Organization and submit them to the Assembly;
3. receive reports and proposals of the Committees and other organs and submit them to the 4. Assembly and Member States, with comments and recommendations as appropriate;
5. appoint the Secretary-General, subject to the approval of the Assembly;
6. enter into agreements or arrangements concerning the relationship of the Organization with other organizations, subject to approval by the Assembly

Q. Five Main Committees & Sub committees of IMO

Q. Mepc / Msc what does it deal with?

Organizational Structure of the International Maritime Organization

The Maritime Safety Committee (MSC),

The Marine Environment Protection Committee (MEPC),

The Technical Cooperation Committee (TCC),

The Legal Committee (LC), and

The Facilitation Committee (FC) of the International Maritime Organization (IMO) are the IMO committees that deal structurally with maritime issues.

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Function 3

Maritime Safety Committee (MSC)
- The MSC is the highest technical body of the Organization. It consists of all Member States.
- The functions of the Maritime Safety Committee are to "consider any matter within the scope of the Organization concerned with
1. aids to navigation, construction and equipment of vessels,
2. manning from a safety standpoint,
3. rules for the prevention of collisions,
4.handling of dangerous cargoes, maritime safety procedures and requirements,
5. hydrographic information,
6. log-books and navigational records,
7. marine casualty investigations,
8. salvage and rescue and any other matters directly affecting maritime safety".

It also has the responsibility for considering and submitting recommendations and guidelines on safety for possible adoption by the Assembly.

The Marine Environment Protection Committee (MEPC)
The MEPC, which consists of all Member States, is empowered to consider any matter within the scope of the Organization concerned with prevention and control of pollution from ships.
In particular it is concerned with the adoption and amendment of conventions and other regulations and measures to ensure their enforcement.

Legal Committee (LC)
The Legal Committee is empowered to deal with any legal matters within the scope of the Organization

Technical Cooperation Committee (TCC)
The Technical Cooperation Committee is required to consider any matter within the scope of the Organization concerned with the implementation of technical cooperation projects for which the Organization acts as the executing or cooperating agency and any other matters related to the Organization's activities in the technical cooperation field.

Facilitation Committee (FC)
The Facilitation Committee deals with IMO's work in eliminating unnecessary formalities and "red tape" in international shipping by implementing all aspects of the Convention on Facilitation of International Maritime Traffic 1965 and any matter within the scope of the Organization concerned with the facilitation of international maritime traffic.

Sub-Committees
The MSC and MEPC are assisted in their work by a number of sub-committees which are also open to all Member States:
Sub-Committee on Human Element, Training and Watchkeeping (HTW);

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Function 3

Sub-Committee on Implementation of IMO Instruments (III);
Sub-Committee on Navigation, Communications and Search and Rescue (NCSR);
Sub-Committee on Pollution Prevention and Response (PPR);
Sub-Committee on Ship Design and Construction (SDC);
Sub-Committee on Ship Systems and Equipment (SSE); and
Sub-Committee on Carriage of Cargoes and Containers (CCC).

Q. What are the four pillars of an international maritime organization?

The Safety of Life at Sea (SOLAS) Convention, the International Convention for the Prevention of Pollution from Ships (MARPOL), the Convention for Standards of Training, Certification, and Watchkeeping for Seafarers, and the Maritime Labor Convention

Q. Convention / Protocol what is it?

Conventions are formal agreements between countries that outline specific obligations and standards. They are typically negotiated and adopted in international forums and require ratification by member states to become legally binding.
For example, shipping has many conventions that were negotiated under International Maritime organisation (IMO).

Some of these are International convention on safety of life at sea (SOLAS)
International convention for prevention of pollution at sea (MARPOL)
International convention on Load Lines
International convention on Tonnage measurement of ships
International convention on the control of harmful anti fouling system on ships

A protocol is one of the ways in which a convention can be modified. They often address specific aspects not fully covered in the original convention or introduce new obligations.

A protocol is used for the modification of an IMO convention
When There is a significant change to the original convention
When a new chapter is added to the original convention. For example when Annex VI was added to the MARPOL
When a change is applicable to the all the chapters
When IMO feels, the change need to be brought by the protocol

The amendments by protocols are not binding on all the states that have ratified the original convention. The amendments by the protocols are only binding to the states that ratify the new protocol.

Function 3

Feature	Convention	Protocol
Purpose	Establishes broad principles and standards	Specifies detailed obligations or amendments
Nature	A standalone agreement that requires ratification	An extension or modification of a convention
Binding Status	Legally binding once ratified	Legally binding if ratified, but linked to a convention
Examples	United Nations Framework Convention on Climate Change (UNFCCC)	Kyoto Protocol to the UNFCCC

Q. MS notice what is it and who issues it?

MS Notices provide mandatory information that must be adhered to under maritime law, helping ensure compliance with safety, environmental, and operational standards.
Issued by DGS

Last MS notice - 13/2024
Procedure and requirements for PANS to enter Indian port facilities
2024 - 13 such notices till now

Q. Latest Dg circulars

27/2024 Evaluation of MTI under STCW requirements
25/2024 Changes brought in E-Governance e-migrate system related to SMS alerts, port and country of joining and procedures for viewing acknowledging sea service details by seafarers - reg

Q. Difference between Hamburg rules and Hague visby rules

The Hamburg Rules and the Hague-Visby Rules are two significant sets of international regulations governing the carriage of goods by sea. Each set of rules was developed to address the needs of shippers and carriers, but they differ in their scope, application, and liability frameworks.

1. Applicability:
Hague-Visby Rules: These rules apply specifically to contracts of carriage evidenced by a bill of lading or similar documents of title. They do not cover charter parties or non-negotiable documents, except for straight bills of lading.

Hamburg Rules: In contrast, the Hamburg Rules apply to all contracts of carriage by sea, regardless of whether a bill of lading is issued. This includes various forms of documentation and does not restrict itself to documents of title.

Function 3

2. Period of Responsibility:
Hague-Visby Rules: The carrier's liability is limited to the period from when the goods are loaded onto the ship until they are discharged (known as "tackle-to-tackle").

Hamburg Rules: The carrier is responsible for the goods from the time they are received at the port of loading until they are delivered at the port of discharge, covering a broader timeframe that includes transshipment.

3. Liability Framework:
Hague-Visby Rules: The rules provide a list of exceptions that limit carrier liability, which can protect carriers from various claims related to loss or damage during transit.

Hamburg Rules: These rules establish a more unified system of liability based on fault, meaning that carriers can be held liable for loss or damage unless they prove that they took all necessary measures to prevent it.

4. Carrier Definition:
Hague-Visby Rules: The carrier is defined as either the shipowner or charterer who enters into a contract with the shipper.

Hamburg Rules: The definition is broader; any person who concludes a contract of carriage with a shipper qualifies as a carrier, including actual carriers who perform part of the carriage.

5. Claims Period:
Hague-Visby Rules: Shippers must initiate claims within one year from delivery or expected delivery dates.

Hamburg Rules: The timeframe for initiating claims is extended to two years, allowing shippers more time to pursue legal action against carriers.

6. Regulations on Dangerous Goods:
Hague-Visby Rules: The shipper can only load dangerous goods with the carrier's consent, limiting their responsibility in this area.

Hamburg Rules: Shippers must properly label dangerous goods and inform carriers about them, placing more responsibility on shippers to ensure safety during transport

Q. Scopic
SCOPIC, or the Special Compensation Protection and Indemnity Clause, is a significant provision in maritime salvage operations, particularly when dealing with the complexities of compensation for salvors.

Function 3

SCOPIC was introduced to address the limitations of traditional salvage compensation mechanisms, particularly under Article 14 of the 1989 Salvage Convention.
It aims to provide a more predictable and fair compensation framework for salvors, especially in cases where there is a risk of environmental damage but the salvage operation may not yield significant financial returns

SCOPIC is an optional clause that can be included in LOF contracts, allowing parties to agree on its terms before a salvage operation begins. It is not automatically included; both parties must explicitly state its incorporation in the contract

Under SCOPIC, salvors can receive compensation that exceeds what would typically be awarded under Article 14. This includes remuneration for efforts to prevent environmental damage, which may not necessarily fall under traditional salvage awards

Upon invoking SCOPIC, shipowners are required to provide a bank guarantee or P&I Club letter for a minimum amount (usually $3 million) within two working days. This security ensures that salvors are compensated for their services even if the operation does not result in a successful salvage

The clause introduces additional roles such as the Special Casualty Representative (SCR), who oversees the salvage operation and ensures that all parties' interests are considered. The SCR must act impartially and report on the progress and costs incurred during the salvage

While SCOPIC enhances compensation for salvors, it also includes provisions that allow shipowners to withdraw from it under certain conditions, provided they give appropriate notice and there is no ongoing environmental threat3. Additionally, SCOPIC payments are not considered General Average contributions and cannot be claimed under hull and machinery insurance policies

By Anuj Kumar

Function 3

Basel convention

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal is a pivotal international treaty aimed at managing hazardous waste.
Adopted on March 22, 1989, in Basel, Switzerland, the Convention entered into force on May 5, 1992. It was established in response to growing concerns about hazardous waste dumping, particularly in developing countries.

The primary goal of the Basel Convention is to protect human health and the environment from the adverse effects of hazardous wastes. This includes regulating their generation, transboundary movements, and disposal methods.

Prior Informed Consent (PIC):
The Convention requires that any transboundary movement of hazardous waste must be conducted with the consent of the importing country. This means that exporting countries must notify and receive consent from the receiving countries before any hazardous waste can be shipped.
Waste Minimization:
Parties are encouraged to minimize the generation of hazardous wastes and manage them as close to their source as possible. This aims to reduce environmental impacts and promote sustainable waste management practices.

Export Restrictions:
The Convention prohibits exports of hazardous wastes to countries that have banned their importation and restricts movements to non-parties of the Convention. This is designed to prevent wealthy nations from dumping waste in less developed countries with weaker environmental regulations.

Illegal Traffic:
The Basel Convention criminalizes illegal traffic in hazardous wastes but lacks specific enforcement mechanisms. It emphasizes the responsibility of involved states to ensure safe disposal if illegal movements occur.

Basel Ban Amendment:
Adopted in 1995, this amendment seeks to prohibit the export of hazardous waste from developed countries (primarily OECD members) to developing nations, even for recycling purposes. While accepted by many countries, it has not yet entered into force due to insufficient ratifications.

By Anuj Kumar

Function 3

ISPS Code

Q. Basic of Isps code

The ISPS Code was adopted in response to increased security threats following the September 11, 2001 terrorist attacks.
It was developed under the auspices of the International Maritime Organization (IMO) and became part of the Safety of Life at Sea (SOLAS) Convention, specifically Chapter XI-2, which came into force on July 1, 2004

The primary aim of the ISPS Code is to establish a comprehensive framework for governments, port authorities, and shipping companies to cooperate in identifying and mitigating security threats to ships and port facilities involved in international trade

Ships applicable to the Code include passenger ships (including high-speed passenger ships), cargo ships of 500 gross tonnage and above (including high-speed cargo ships) and mobile offshore drilling units. Those not applicable to the Code are the warships, naval auxiliary vessels, or other ships, owned or operated by the governments of the contracting states, which are used only for government non-commercial services.

Mandatory Requirements:
The ISPS Code consists of two parts:
Part A: Contains mandatory security measures that must be implemented by contracting governments and shipping companies.
Part B: Provides guidance on how to implement these measures effectively.

Security Levels:
The ISPS Code establishes three security levels:
Level 1: Normal security conditions; minimum security measures must be maintained.
Level 2: Heightened security; additional measures are required due to increased risk.
Level 3: Exceptional security; specific measures are implemented when a security incident is probable or imminent .

Roles and Responsibilities:
The Code mandates that each ship must have designated personnel, including:
Company Security Officer (CSO): Responsible for overall security management.
Ship Security Officer (SSO): Manages day-to-day security operations on board.
Port Facility Security Officer (PFSO): Oversees security at port facilities .

Security Plans:
Ships and port facilities must develop and maintain a Ship Security Plan (SSP) and a Port Facility Security Plan (PFSP), respectively. These plans outline procedures for responding to various security threats

Q. Certificates/documents as per ISPS code

Function 3

Ship Security Plan (SSP):
- The company should formulate a ship security plan (SSP) based on the ship security assessment report, and after passing the audit of the competent authority or its authorized security accreditation body, an approval letter of ship security plan will be issued for the ship.
- Any modification of the ship security plan should be approved by the competent authority or its authorized security accreditation body.

Interim International Ship Security Certificate (Interim ISSC):
- Provided to new ships or those changing flags before a full ISSC can be issued.
- Valid for a maximum of six months and cannot be extended.
- Issued after preliminary verification of compliance with security measures

International Ship Security Certificate (ISSC):
- Certifies that a ship complies with the ISPS Code requirements, including having an approved Ship Security Plan (SSP).
- Typically valid for five years, subject to an intermediate verification between the second and third anniversary.
- Issued after an initial verification by a Recognized Security Organization (RSO) or flag state administration, confirming that the SSP has been implemented on board for at least 30 days

Review of SSP duration

The Ship Security Plan (SSP) is a critical document mandated by the International Ship and Port Facility Security (ISPS) Code.
It outlines procedures and measures to enhance security aboard ships, particularly during emergencies or threats. A review of the SSP's duration involves understanding its maintenance, updates, and the frequency of reviews.

Initial Approval:
The SSP must be approved by the relevant maritime authority or a Recognized Security Organization (RSO) before it can be implemented on board. This approval is contingent upon a successful verification process that confirms compliance with ISPS requirements.

Validity Period:
Once approved, the SSP is valid for up to five years, subject to intermediate verifications. These checks ensure that the plan remains effective and compliant with any changes in security regulations or operational practices.

Regular Reviews:
The Ship Security Officer (SSO) is responsible for regularly reviewing the SSP to identify any shortcomings or necessary updates. This review process should occur at least annually or whenever there are significant changes in operations, security threats, or after incidents that may affect the ship's security posture.

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Function 3

Amendments:
The SSP must be amended if there are changes in the ship's operations, security assessments, or if new threats are identified. The Company Security Officer (CSO) oversees these amendments and ensures that they align with current security practices.

Documentation and Confidentiality:
The SSP is a confidential document and should be securely stored to prevent unauthorized access. Only designated personnel, such as the CSO and SSO, should have access to it, ensuring that sensitive information is protected during inspections or audits.

Training and Drills:
Regular training exercises and drills are essential to ensure that crew members are familiar with the SSP and can effectively implement its provisions in real situations. This ongoing training supports the continuous improvement of the plan's effectiveness.

Q. Duties of SSO

The Ship Security Officer (SSO) is a designated officer onboard a ship tasked with ensuring the security of a ship. The prerequisite to be a designated Ship Security Officer is a minimum of 12 months of sailing experience and a Ship Security Officer Course certificate from a recognized maritime training institute.

Duties of a Ship Security Officer
The ISPS Code defines the role and duties of a Ship Security Officer (SSO). It defines ten duties for an SSO. However, this is not an exhaustive list. The ten duties of a Ship Security Officer are:
- Regular inspections
- Implementation of the Ship Security Plan (SSP)
- Coordinating the security aspects during ship operations
- Suggesting modifications to the SSP
- Reporting non-conformities and deficiencies to the Company Security Officer (CSO)
- Improving security awareness onboard
- Ship crew training
- Reporting of security incidents
- Coordination with CSO and Port Facility Security Officer (PFSO)
- Maintenance of security equipment

Regular security inspections
The Ship Security Officer must conduct regular inspections and verify all pertinent ISPS security equipment, procedures, and human interactions are satisfactory. Any deficiency must be corrected and brought to the notice of the Master and the CSO to prevent recurrence.

Implementation of the Ship Security Plan (SSP)

Function 3

The Company Security Officer prepares the ship security plan that contains all the procedures to be followed on a ship in the case of emergencies and threats. It is the job of the ship security officer onboard to ensure that the ship security plan is complied with at all security levels.

Coordinating the security aspects during ship operations

The SSO supervises the security aspects during ship operations such as cargo handling and ship stores management. The SSO is overall in charge and works with ship crew and port facility security officers for secure operations.

Suggesting modifications to the SSP

The SSO also reviews the SSP. Depending on the route and trading specifics, a ship's SSP may need modifications. For instance, if a vessel regularly trades in high-risk areas, the ship may require specific security equipment for robust security.

The SSO periodically evaluates the SSP to ensure it contains all the procedures and information for the most optimal security.

Reporting non-conformities and deficiencies

Inspections happen regularly on a ship. Some examples are flag state inspections, class inspections, vetting inspections, and internal audits. The observations raised during these inspections may be related to ship security.

The SSO must promptly notify the Company Security Officer (CSO) and other stakeholders of these non-conformities and deficiencies for effective rectification. Depending on the nature of the observation, changes may sometimes be required to the SSP.

Improving security awareness onboard

The SSO must continuously strive to increase the level of security awareness among the crew members. All crew must be regularly monitored during duties to ensure they are highly aware and vigilant concerning any security issues.

This includes, among other things, familiarising the crew members with the three security levels and the allowed and restricted areas for each level.

Ship Crew Training

In addition to verbal training, frequent security drills must be carried out to improve emergency preparedness. Security drills such as bomb searches, stowaway searches, and pirate attacks can train the ship crew practically for enhanced performance during emergencies.

Assist with Ship Security Assessment

The Ship Security Assessment (SSA) is a periodic security review carried out by the company to ensure compliance. The objectives of a comprehensive SSA include identifying security measures, threats, and any weaknesses within the system.

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Function 3

The Company Security Officer (CSO) may perform the SSA himself or engage someone else to do it on his behalf. The role of the SSO is to assist the person carrying out the Ship Security Assessment (SSA). He is the most appropriate person to do so as he intimately understands the ship's security.

Maintenance of ship security equipment

The ship has security items onboard such as high-beam flashlights, batons, metal detectors, visitor ID cards, visitor log books, visitor badges, seals, barrier tapes, whistles, and night vision binoculars. All of these items need to be checked, operated, tested, calibrated, and maintained periodically.

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Function 3

COSWP

This Code is published by the Maritime and Coastguard Agency (MCA).

Purpose

COSWP provides best practices for ensuring the safety and health of seafarers while working on ships. It covers various aspects of maritime operations, including regulatory frameworks, safety management principles, and practical advice for safe working practices.

The latest edition was published on March 28, 2024. This update modernizes the document, enhancing its structure and clarity while maintaining essential safety guidance.

The COSWP consists of 26 chapters that address a wide range of topics relevant to seafarers
The MCA commits to regular reviews of the COSWP to keep its content current and relevant, incorporating feedback from industry representatives

COSWP chapter 9 colour coding

The Merchant Shipping and Fishing Vessels (Safety Signs and Signals) Regulations 2001 (S.I. 2001/3444) establish guidelines for health and safety signs and signals on merchant and fishing vessels.

- Employers must conduct risk assessments to identify hazards that cannot be sufficiently reduced by other measures. In such cases, appropriate safety signs must be provided and maintained.

- Safety signs are considered a last resort for alerting workers to residual risks that remain after implementing other safety measures.
- Signs must comply with standards set out in the annexes of the relevant EU directive ensuring they are easily understood across Europe.

Requirements for Safety Signs
- Safety signs must be installed where risk assessments indicate significant hazards.
- The signs should provide clear warnings or instructions regarding protective measures.
- Signs must be kept clean and unobstructed to ensure visibility.
- Regular checks should be conducted to maintain their effectiveness.
- The types of signs required depend on the specific risks identified during the assessment.
- Employers are responsible for ensuring that any hand signals or verbal communications described in the directive are also used where applicable

Q. Permit to work systems purpose and procedure

A permit to work provides an organised and predefined safety procedure. It does not in itself make the job safe but ensures that you follow measures for safe working.
Ship's SMS will indicate when to use a permit to work, and will provide the form for it. Each permit to work should be relevant and as accurate as possible for the task.

Function 3

Procedure

- Before signing the permit, the authorised officer should ensure that all safety precautions and measures specified as necessary have been taken, or that procedures are in place.
- The authorised officer is responsible for the work until they have either closed the permit or formally transferred it to another authorised officer and fully briefed them on the situation.
- Anyone who takes over from the authorised officer, either routinely or in an emergency, should sign the permit to indicate transfer of full responsibility.
- The competent person responsible for carrying out the specified work should countersign the permit to indicate that they understand the safety precautions and measures to be observed.
- When the work is complete, the competent person should notify the authorised officer and ensure that the authorised officer has closed the permit.

A permit to work should include the:

- location of the work to be done
- details of the work to be done
- nature of any preparatory tests undertaken, and the results
- measures undertaken to make the job safe
- safeguards to take during the operation
- period of validity of the permit to work (should not exceed 24 hours)
- time limits applicable to the work that it authorises.

Q. Who issues the permit and as per what

Company SMS manual designates who is comptent person and authorised person onboard.

Competent person' means someone designated and authorised for the task covered by a permit to work under the safety management system (SMS)
An 'authorised officer' means someone designated and authorised to issue and close permits to work under the SMS.

Q. Enclosed Space Entry

An enclosed space is one that is not designed for continuous worker
occupancy and has either or both of the following characteristics:

- limited openings for entry and exit
- inadequate ventilation.

cargo spaces, double bottoms, fuel tanks, ballast tanks, cargo pump rooms, cargo compressor rooms, cofferdams, chain lockers, void spaces, duct keels

A competent person means a person with sufficient theoretical knowledge and practical experience to make an informed assessment of the likelihood of a dangerous atmosphere being present or subsequently arising in the space, including taking measurements of the atmosphere.

Function 3

An authorised officer means a person authorised to permit entry into an enclosed space and with sufficient knowledge of control and elimination of hazards, and of the procedures to be established and complied with on board, to be able to ensure that the space is safe for entry.

Oxygen (O_2)	At least 20% by volume (see section 15.5.7)
Flammable gas	Nil Note: where readings have been steady for some time, up to 1% of the lower flammable limit (LFL) may be acceptable in conjunction with a 20% oxygen level
Carbon monoxide (CO)	Content is less than: **100 ppm** short-term exposure limit (STEL): maximum exposure is 15 minutes* **20 ppm** time weighted: maximum exposure is 8 hours*
Hydrogen sulphide	Content is less than: **10 ppm** STEL: maximum exposure is 15 minutes* **5 ppm** time weighted: maximum exposure is 8 hours*
Toxic gases	Less than 50% of the WEL*

Ammendment

The MIN 688 (M) Amendment 2 pertains to the Code of Safe Working Practices for Merchant Seafarers (COSWP), which has been updated to enhance safety protocols and improve clarity in the guidance provided to seafarers.

Publication Date: The latest edition was issued on March 28, 2024, and will replace the previous version until March 31, 2025

- Glossary is added
- The document has undergone a significant redesign to improve its structure and make it more user-friendly.
- Changes include a transition from a loose-leaf format to a bound edition, which simplifies updates and reduces administrative burdens
- The amendment includes new chapters and updates to existing ones, focusing on practical safety measures.

Specific updates cover topics such as:
Sunglasses: Guidance on their use to protect against glare.
Risk from Sharps: Information on handling sharp objects safely.
Solid Carbon Dioxide: Safety measures related to its use.
Safe Access to Small Craft: Procedures to ensure safe boarding and disembarking

By Anuj Kumar

Function 3

MLC

The Maritime Labour Convention, 2006, as amended, (MLC, 2006), was adopted by the 94th (Maritime) Session of the International Labour Conference (ILC) on 23 February 2006.

The Convention, known as “MLC, 2006” came into force on 20 August 2013

Maritime Labour Convention 2006 (MLC)
- Minimum requirements for seafarers to work on a ship
- Conditions of employment
- Accommodation, recreational facilities, food and catering.
- Health protection, medical care, welfare and social security protection

Q. Titles of MLC
Q. What is 2.5 and 4.2 in MLC

Title 1. Minimum requirements for seafarers to work on a ship
Regulation 1.1 – Minimum age
Regulation 1.2 – Medical certificate
Regulation 1.3 – Training and qualifications
Regulation 1.4 – Recruitment and placement

Title 2. Conditions of employment
Regulation 2.1 – Seafarers’ employment agreements
Regulation 2.2 – Wages

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Regulation 2.3 – Hours of work and hours of res
Regulation 2.4 – Entitlement to leave
Regulation 2.5 – Repatriation
Regulation 2.6 – Seafarer compensation for the ship's loss or foundering
Regulation 2.7 – Manning levels
Regulation 2.8 – Career and skill development and opportunities for seafarers' employment

Title 3. Accommodation, recreational facilities, food and catering
Regulation 3.1 – Accommodation and recreational facilities
Regulation 3.2 – Food and catering

Title 4. Health protection, medical care, welfare and social security protection
Regulation 4.1 – Medical care on board ship and ashore
Regulation 4.2 – Shipowners' liability
Regulation 4.3 – Health and safety protection and accident prevention
Regulation 4.4 – Access to shore-based welfare facilities
Regulation 4.5 – Social security

Title 5. Compliance and enforcement
Regulation 5.1 – Flag State responsibilities
Regulation 5.1.1 – General principles
Regulation 5.1.2 – Authorization of recognized organizations
Regulation 5.1.3 – Maritime labour certificate and declaration of maritime labour compliance
Regulation 5.1.4 – Inspection and enforcement
Regulation 5.1.5 – On-board complaint procedures
Regulation 5.1.6 – Marine casualties
Regulation 5.2 – Port State responsibilities
Regulation 5.2.1 – Inspections in port
Regulation 5.2.2 – Onshore seafarer complaint-handling procedures
Regulation 5.3 – Labour-supplying responsibilities

Q. Where will you find death and disability benefit
Q. Death and disability compensation to seafarers
Compensation for death and disability among seafarers is governed by various regulations and agreements,
1. primarily under the Maritime Labour Convention (MLC) 2006
The MLC mandates that shipowners establish financial security systems to ensure compensation for death and long-term disability. This includes coverage for medical expenses, wages during incapacitation, and burial services.

2. Specific Collective Bargaining Agreements (CBA)
Specific terms regarding compensation are often detailed in CBAs. These agreements may vary between companies but must align with national laws and international standards set by the MLC.

Function 3

Seafarer death and long-term disability are seafarers rights and would be provided to seafarer / NoK as per agreed terms & conditions as per applicable CBA
DGShipping have adopted compensation due to seafarers and their family in law (MS Rules)
Seafarer or NoK representative can directly request contractual compensation
If the nature of long-term disability makes it difficult to assess the full compensation, seafarer must be given an interim payment to avoid undue hardship
Seafarer of NoK must approach the company for compensation claims and if there are unusual delays, should approach Directorate for expediting the matter

Death cases (where NO compensation would be given by ship-owners) to NoK
- Seafarer commits suicide (witness / with proof such as CCTV recording etc.)
- Seafarer death due to non occupational disease (suffering from cancer, TB etc. prior joining)
- Seafarer doesn't declare his health / medical issues (due diligence)

DGS M.S. Notice No. 07 of 2020 Reg. Terms and Conditions of employment of Seafarers engaged on Indian flag ships
Death and disability compensations for all "Trainees" shall not be less than INR 10 Lakhs.
The disability compensation shall be over and above the cost of treatment and the wages payable as applicable. A disability of 50 % or more shall be considered as full disability

As per CBA
Disability Article 25
The disability suffered by the seafarer shall be determined by a doctor appointed by the Company. If a doctor appointed by or on behalf of the seafarer disagrees with the assessment, a third doctor may be nominated jointly between the Company and the Union and the decision of this doctor shall be final and binding on both parties

A seafarer whose disability, is assessed at 50% or more shall, for the purpose of this paragraph, be regarded as permanently unfit for further sea service in any capacity and be entitled to 100% compensation. Furthermore, any seafarer assessed at less than 50 % disability but certified as permanntly unfit for further sea service in any capacity by the Company-nominated doctor, shall also be entitled to 100 % compensation

By Anuj Kumar

Function 3

2023			
Degree of Disability	Rate of Compensation		
Percentage (%)	Ratings	Junior Officers	Senior Officers (4)
100	109,632	146,175	182,718
75	82,223	109,632	137,038
60	65,779	87,705	109,632
50	54,816	73,088	91,360
40	43,852	58,471	73,088
30	32,890	43,852	54,816
20	21,927	29,235	36,546
10	10,964	14,618	18,272

Note: "Senior Officers" for the purpose of this clause means Master, Chief Officer, Chief Engineer and 2nd Engineer.

Death Article 26

If a seafarer dies through any cause whilst in the employment of the Company including death from natural causes and death occurring whilst travelling to and from the vessel, or as a result of marine or other similar peril, but excluding death due to wilful acts, the Company shall pay the sums specified to a nominated beneficiary and to each dependent child up to a maximum of 4 (four) under the age of 18.

If a seafarer goes missing at sea, whilst in the employment of the Company, including missing by accident or as a result of marine or other similar peril, but excluding missing due to an act of suicide, or a disappearance in port, the Company shall pay the same amounts as specified for Loss of Life-Death in Service

To the nominated beneficiary: $ 109,632
To each dependent child (maximum 4 under the age of 18) $ 21,927

Q. Regulations governing rest hours.
Q. Max work and rest hours requirement.

Ans.

STCW 2010 Section A VIII/1

Minimum Rest Hours:
10 hours of rest in any 24-hour period.
77 hours of rest in any 7-day period.

Rest Period Division:
Rest may be divided into no more than two periods, with one period being at least 6 hours long.
The interval between consecutive periods of rest must not exceed 14 hours.

Flag states may allow exceptions from the required hours of rest provided that:
1. The rest period is not less than 70 hours in any 7-day period.

2. Exceptions are not allowed for more than two consecutive weeks.
3. The intervals between two periods of exceptions on board shall not be less than twice the duration of the exception;
4. The hours of rest may be divided into no more than three periods, one of which shall be at least 6 hours and none of the other two periods shall be less than one hour in length;
5. The intervals between consecutive periods of rest shall not exceed 14 hours;
6. Exceptions shall not extend beyond two 24-hour periods in any seven-day period.

Maritime Labour Convention 2006('MLC') MLC Standard A.2.3.5
Maximum hours of work must not exceed:
14 hours in any 24-hour period.
72 hours in any 7-day period.
Or

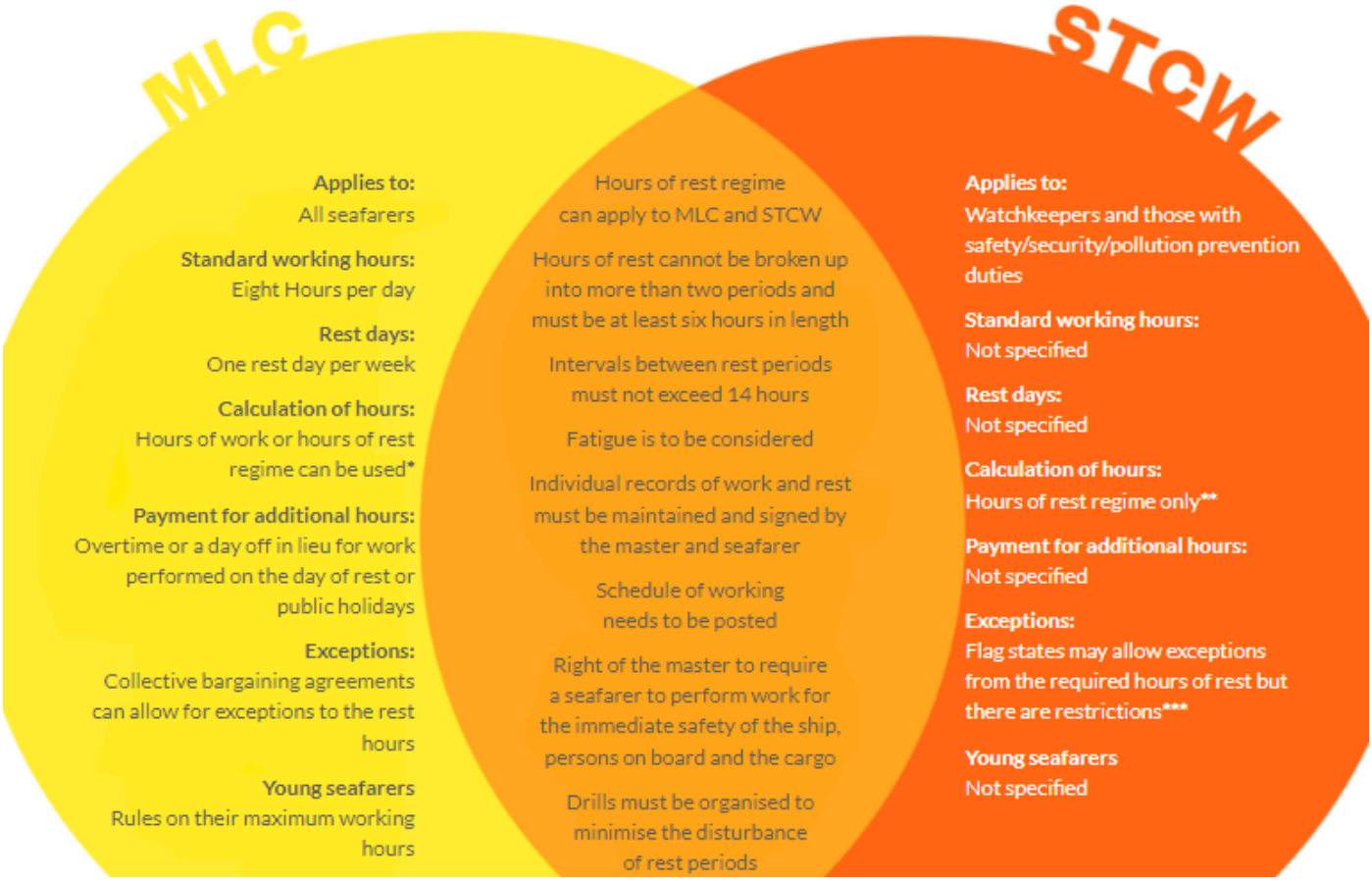
Minimum Rest Hours shall not be less than :
A minimum of 10 hours of rest in any 24-hour period.
A minimum of 77 hours of rest in any 7-day period.

Rest Period Division:
Hours of rest may also be divided into no more than two periods, with one being at least 6 hours long, similar to STCW.

- Account must be taken of the danger posed by the fatigue of seafarers.
- Any mandatory musters or drills must be conducted in a way that minimises disturbances of rest hours and does not induce fatigue.
- A schedule/table of service at sea and service at port for all positions must be posted on the ship. It must be in the working language of the ship and in English.
- A record of a seafarer's daily hours of rest or hours of work must be kept on board in the working language of the ship and in English, and must be signed by the seafarer and the master or other authorized person. The seafarer must be given a copy.
- In the event of an emergency or to give assistance to other ships or persons in distress at sea, the master can suspend the work schedule until the problem is resolved. If normal working hours are disrupted, a seafarer is entitled to an adequate compensatory rest period.

Q. Where all are the work rest hours mentioned and the difference

Function 3



Q. Define Seafarer

According to the Maritime Labour Convention (MLC) 2006, seafarers are defined as individuals who are employed or engaged in any capacity on board a ship. This includes crew members who perform navigational, engineering, and operational duties essential for the ship's functioning.

Q. Are security guards Seafarers?

This will depend on flag state rules and regulations. Various flag states have following consultations with their social partners decided to exclude armed guards.

Maritime security guards are typically hired by private security firms and are responsible for ensuring safety and security on board vessels, particularly in high-risk areas. Their employment conditions and rights differ from those of traditional seafarers.

Q. Documents required to be maintained onboard for Maritime Labour

Required Documents for Maritime Labour Compliance

1. Declaration of Maritime Labour Compliance (DMLC):

Part I: Outlines the obligations of the shipowner under the MLC.

Part II: Details how the ship complies with these obligations.

2. Maritime Labour Certificate:

Issued following an inspection, confirming compliance with MLC standards.

By Anuj Kumar

Function 3

3. Recent Inspection Report:
Documentation of the most recent inspections related to MLC compliance.

4. Evidence of Age Compliance:
Proof that all seafarers onboard are above 16 years of age.

5. Compliance Evidence for Crewing Agencies:
Documentation showing that any crewing agencies used comply with MLC requirements.

6. Medical Certificates:
For seafarers under 18 years: A medical certificate valid for a maximum of one year.
For seafarers over 18 years: A medical certificate valid for a maximum of two years.

7. Evidence of Work Restrictions for Minors:
Proof that no dangerous work or night-time work is being undertaken by seafarers under 18 years old.

8. Seafarer's Employment Agreement (SEA):
Signed by both the seafarer and the ship owner or an authorized representative.

9. Collective Bargaining Agreement (CBA):
A copy of any applicable CBA, including an English version if necessary.

10. Certificates of Competency (CoC):
Valid CoCs and training certificates for all seafarers onboard.

11. Training Records:
Documentation of training in personal safety and records of safety meetings held onboard.

12. Accident and Incident Records:
Records of all accidents, incidents, investigations, and consequent analyses onboard.

13. Familiarization Records:
Records confirming that seafarers have been familiarized with their duties and responsibilities, including work/rest hour records.

Q. Certificates as per mlc, Who issues

Maritime Labour Certificate (MLC Certificate)
Certifies that a ship complies with the requirements of the MLC.
Issuing Authority: Issued by the competent authority of the flag state or a recognized organization (RO) following an inspection.

Declaration of Maritime Labour Compliance (DMLC)

Function 3

Part I: Issued by the flag administration, outlining national requirements for compliance.
Part II: Prepared by the shipowner, detailing how the requirements will be met on board. This part must be approved by the flag administration or an RO.

Q. Dmlc part 1 & 2

DMLC Part I

- DMLC Part I is prepared by the flag state and outlines the national laws and regulations that implement the MLC provisions.
It serves as a reference for inspectors during certification and inspection processes.

This document includes:
- Identifies the topics for inspection
- A summary of the national laws or regulations that give effect to the MLC.
- References to specific legal provisions that correspond to the requirements of the MLC.
- Any flag-specific exemptions or additional requirements.

DMLC Part I is essential for establishing the legal framework within which the ship operates concerning seafarers' rights and working conditions.
It must be assessed alongside DMLC Part II during inspections for MLC certification

DMLC Part II

- DMLC Part II is developed by the shipowner or operator and outlines how the ship will comply with the national requirements specified in DMLC Part I.
- It details the measures and procedures that will be implemented to maintain compliance with MLC standards.

This document includes:
- A plan for ensuring ongoing compliance with MLC requirements.
- Specific measures that will be taken to uphold seafarers' rights regarding working and living conditions.
- Records of inspections, maintenance, and other relevant activities related to compliance.

DMLC Part II acts as a commitment from the shipowner to adhere to the established standards and provides a framework for maintaining compliance between inspections.
It is attached to the Maritime Labour Certificate

Q. MLC amendment

New important set of amendments to the MLC, 2006 will enter into force on 23 December 2024.
GENEVA (ILO News) - It is now confirmed that the eight amendments to the Code of the Maritime Labour Convention, 2006, as amended (MLC, 2006) adopted by the ILO in 2022 will come into force on 23 December 2024.

1. Recruitment and placement

Function 3

Recruitment and placement agencies must compensate seafarers for financial losses resulting from failures to fulfill employment agreements.
Seafarers must be informed about these protections.

2. Repatriation
The amendments emphasize the need for the prompt repatriation of seafarers, including those abandoned at sea.
The responsibility for this falls on the port state, flag state, and labor-supplying country.

3. Accommodation and recreational facilities/Access to shore-based welfare facilities
Seafarers are provided with appropriate social connectivity on board;
Shipowners, so far as is reasonably practicable, provide seafarers on board their ships with internet access with charges, if any, being reasonable in amount.
Port States do the same for seafarers on board ships in their ports and at their associated anchorages.

4. Food and catering
Good quality drinking water is available free of charge for seafarers;
Meals provided are balanced;
Supplies of food and drinking water are inspected in relation to their quantity, quality, nutritional value, quality and variety.

5. Medical care on board ship and ashore
Seafarers are promptly disembarked when they are in need of immediate medical care and are given access to medical facilities ashore in cases of, among others, any serious injury or disease, any injury involving broken bones, severe bleeding, broken or inflamed teeth or severe burns; severe pain which cannot be managed on board ship and suicide risk.
Member States facilitate the repatriation by the shipowner of the body or ashes of seafarers who have died on board.

6. Health and safety protection and accident prevention
Seafarers have appropriately-sized personal protective equipment, in particular to suit the increasing number of women seafarers;
All deaths of seafarers are recorded and reported annually to the ILO and the relevant data is published.
7. Financial security
The documentary evidence of financial security includes the name of the registered owner if different from the shipowner.

Q. Insurance for crew under MLC
The Maritime Labour Convention (MLC) requires shipowners to have insurance or financial security in place to cover the costs of crew member repatriation, medical care, and other needs:
1. Repatriation:

Function 3

Coverage for the costs associated with repatriating seafarers in circumstances such as abandonment or insolvency of the shipowner. This includes transportation back to their home country and any essential needs (food, accommodation, medical care) until repatriation.

2.Medical care:
Medical treatment, medicines, and therapeutic appliances

4. Wages and entitlements:
Insurance must cover up to four months of outstanding wages and entitlements for seafarers who have been abandoned. This ensures that crew members receive their due payments even if the shipowner defaults.

5. Death or long-term disability:
Coverage for contractual claims arising from death or long-term disability due to occupational injuries or illnesses. This includes compensation specified in the seafarer's employment agreement or collective agreements.

6. Burial expenses:
In the case of death occurring on board or ashore during the period of engagement

As of January 18, 2017, ships subject to the MLC must display certificates issued by an insurer or other financial security provider confirming that adequate insurance is in place for these liabilities.

Q. What comes under crew welfare?

Regulation 4.4 – Access to shore-based welfare facilities
- Each member state that has ratified the MLC is required to ensure that existing shore-based welfare facilities are easily accessible to all seafarers, regardless of their nationality, race, color, sex, religion, political opinion, or social origin.
- The member states must promote the development of additional welfare facilities in designated ports to enhance the support available to seafarers

- Member states are tasked with determining which ports will be regarded as appropriate for the establishment of welfare facilities after consulting with relevant shipowners' and seafarers' organizations.
- This involves promoting the establishment of welfare boards that regularly review these facilities to ensure they meet the evolving needs of seafarers

- The welfare facilities may include cultural, recreational, and information services designed to benefit seafarers during their time in port. Examples include meeting rooms, recreation areas, sports facilities, educational resources, and personal counseling services.

By Anuj Kumar

Function 3

The MLC encourages the provision of internet access in ports for seafarers, with reasonable charges if applicable.

Responsibilities of Member States
- Member states are not required to operate these services directly but must facilitate their availability and ensure they are regulated appropriately for accessibility14.
- The convention emphasizes that these services should be open to all seafarers without discrimination based on various personal attributes or the flag state of their ship

Q. What all things you will do for crew welfare as per MLC 2006?
- Verify that all crew members have clear and fair employment contracts that comply with MLC regulations.
- Ensure that medical supplies are available onboard and that crew members know how to access medical care
- Promote regular health checks and maintain records of crew health issues.
- Supporting crew if doctor or dentist visit is required they can avail it for free and without any harm to their current employment
- Conduct risk assessments to identify potential hazards onboard and implement preventive measures.
- Organize regular safety drills (e.g., fire, abandon ship) to ensure preparedness among the crew.
- Creating awareness of ship owners liability incase of death or permanent disability and how to apply for claims
- Support crew members in taking shore leave when operationally feasible, promoting their well-being
- Inform crew about available shore-based welfare facilities and services in ports.
- Regularly inspect living quarters to ensure they meet MLC standards for space, ventilation, and sanitation.
- Facilitate access to recreational activities and equipment to support mental well-being.
- Establish an environment where crew members feel comfortable discussing concerns or grievances.
- Provide opportunities for professional development and training to enhance crew skills and morale.
- Educate crew members about their rights regarding social security benefits, ensuring they understand available protections.

Q. Social security as per MLC?
Regulation 4.5 – Social security
- To ensure that measures are taken with a view to providing seafarers with access to social security protection
- Each member state must ensure that all seafarers and their dependents have access to social security protection in accordance with national laws and the MLC provisions.

- Member states are required to guarantee at least three types of social security benefits from a specified list, which includes:
Medical care
Sickness benefit

Function 3

Unemployment benefit
Old-age benefit
Employment injury benefit
Family benefit
Maternity benefit
Invalidity benefit
Survivors' benefit

- The social security protection provided to seafarers must be no less favorable than that enjoyed by shore workers in the same territory. This includes ensuring that seafarers are not disadvantaged due to their employment at sea

- In some cases, seafarers may need to contribute financially to their social security schemes, either through direct payments or through deductions from their wages. The shipowner is responsible for ensuring that any mandatory contributions are made

- There must be a fair and effective procedure in place for resolving disputes related to social security provisions, ensuring that seafarers can address grievances effectively

Q. Certificates as per mlc, Who issues

Maritime Labour Certificate (MLC Certificate)
Certifies that a ship complies with the requirements of the MLC.
Issuing Authority: Issued by the competent authority of the flag state or a recognized organization (RO) following an inspection.

Declaration of Maritime Labour Compliance (DMLC)
Part I: Issued by the flag administration, outlining national requirements for compliance.
Part II: Prepared by the shipowner, detailing how the requirements will be met on board. This part must be approved by the flag administration or an RO.

Certificates from an insurer or financial security provider as per the Maritime Labour Convention (MLC) are required to be issued for ships to cover the following liabilities:
Abandonment of seafarers,
Claims for death,
Claims for long-term disability,
Outstanding wages and repatriation of seafarers.

The certificates must include the following information:
1. Name, call sign, port of registry, and IMO number of the ship
2. Name, full address, and website of the provider of insurance or other financial security
3. Contact details of the persons or entity responsible for handling seafarers' request for relief
4. Name of the shipowner
5. Period of validity of the financial security

Function 3

An attestation from the financial security provider that the financial security meets the requirements of MLC 2006 standard A 2.5.2 or A 4.2.1

The certificates must be carried on board the ship and displayed in a conspicuous place where seafarers can access them. If more than one provider provides financial security, the document provided by each provider must be carried on board.

Q. MLC onboard complaint procedure -

Action as per MLC 5.1.5
On-Board Complaint Procedures:
Ships must have procedures in place for the fair, effective, and expeditious handling of complaints from seafarers alleging breaches of MLC requirements, including their rights.
These procedures should be designed to resolve issues at the lowest possible level, allowing escalation to higher authorities if necessary.

MSN 04-2013
The following guidelines to observe.
1. Seafarer with a complaint shall bring the matter to the attention of the Head of Department, HOD to acknowledge
2. If the matter not resolved by HOD in 3 Days , then Master to handle persoanlly and solve it within 7Days
5. If master cannot solve then complaint to be escalated to ship owner, ship owner to take promt action and solve within 1 Month.
7. If not solved within 1 month seafarer can approach to authorities as in Grev. Redrssel procedure MSN 03/2013.

Q. Salary not paid for 2 months action

DGS Circular No. 4 of 2017, issued by the Directorate General of Shipping, India. This circular provides important guidelines regarding the employment conditions and rights of seafarers.
- Follow with SOP for non payment of wages to DGCOM centre
- As per this circular seafarer are to intimate DG communication DGCOM along with
Details of Vessel
IMO No.
Port at which she is anchored or Next port of call
Name & Indos No.
RPSL and company name

Dgcommcentre-dgs@vsnl.net

By Anuj Kumar

Function 3

BALLAST WATER MANAGEMENT (BWM) CONVENTION

Adopted 2004
In force 2017

BWM Convention is a treaty adopted by the International Maritime Organization (IMO) in order to help prevent the spread of potentially harmful aquatic organisms and pathogens in ships' ballast water.
From 8 September 2017, ships must manage their ballast water so that aquatic organisms and pathogens are removed or rendered harmless before the ballast water is released into a new location. This will help prevent the spread of invasive species as well as potentially harmful pathogens.

The convention applies to ships registered under contracting Parties to the BWM Convention, which take up and use ballast water during international voyages.

From the date of entry into force, ships in international traffic are required to manage their ballast water and sediments to a certain standard, according to a ship-specific ballast water management plan. Ships have to carry:

An **ballast water management plan** - specific to each ship, the ballast water management plan includes a detailed description of the actions to be taken to implement the ballast water management requirements and supplemental ballast water management practices;

A **ballast water record book** - to record when ballast water is taken on board; circulated or treated for ballast water management purposes; and discharged into the sea. It should also record when ballast water is discharged to a reception facility and accidental or other exceptional discharges of ballast water; and

An **International Ballast Water Management Certificate** - (ships of 400 gt and above) – this is issued by or on behalf of the Administration (flag State) and certifies that the ship carries out ballast water management in accordance with the BWM Convention and specifies which standard the ship is complying with, as well as the date of expiry of the Certificate.

D1 & D2 Standard
There are two ballast water management standards (D-1 and D-2).

The D-1 standard requires ships to exchange their ballast water in open seas, away from coastal areas. Ideally, this means at least 200 nautical miles from land and in water at least 200 metres deep. By doing this, fewer organisms will survive and so ships will be less likely to introduce potentially harmful species when they release the ballast water.

The D-2 standard specifies the maximum amount of viable organisms allowed to be discharged, including specified indicator microbes harmful to human health.

By Anuj Kumar

Function 3

From the date of entry into force of the BWM Convention, all ships must conform to at least the D-1 standard; and all new ships, to the D-2 standard.

Eventually, all ships will have to conform to the D-2 standard. For most ships, this involves installing special equipment to treat the ballast water.

IMO Member Governments, meeting in the Marine Environment Protection Committee (MEPC), have agreed an implementation timetable for existing ships, linked to the ship's International Oil Pollution Prevention Certificate (IOPPC) renewal survey.

The difference is that D-1 relates to ballast water exchange, while D-2 specifies the maximum amount of viable organisms allowed to be discharged, including specified indicator microbes harmful to human health.
D-1 standard - The D-1 standard requires ships to conduct an exchange of ballast water such that at least 95% of water by volume is exchanged far away from the coast.
D-2 standard -
The D-2 standard specifies that ships can only discharge ballast water that meets the following criteria:
less than 10 viable organisms per cubic metre which are greater than or equal to 50 micrometres in minimum dimension;
less than 10 viable organisms per millilitre which are between 10 micrometres and 50 micrometres in minimum dimension;
less than 1 colony-forming unit (cfu) per 100 mililitres of Toxicogenic Vibrio cholerae;
less than 250 cfu per 100 millilitres of Escherichia coli; and
less than 100 cfu per 100 milliliters of Intestinal Enterococci.

Compliance check
Ships may be subject to port State control in any port or offshore terminal of a Party to the BWM Convention.
This inspection may include
-verifying that there is onboard a valid Certificate and an approved ballast water management plan;
-inspection of the ballast water record book;
-and/or sampling of the ship’s ballast water, carried out in accordance with the Guidelines for ballast water sampling (G2).
However, the time required to analyse the samples shall not be used as a basis for unduly delaying the operation, movement or departure of the ship.

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By Anuj Kumar

Function 3

P & I Clubs

Q. P&I Clubs

Protection and Indemnity (P&I) Clubs are mutual insurance associations primarily formed by shipowners to pool risks and provide insurance coverage for maritime liabilities.
Members contribute funds, known as "calls," which are used to cover claims and administrative costs. Any surplus from the previous year can lead to reduced calls in subsequent years

Functions of P&I Clubs

1. Risk Pooling: Through these P&I clubs, shipowners pool their insurance premiums to pay claims on a mutual basis.
2. Claims Handling: Professional managers handle claims efficiently, ensuring that members receive timely support.
3. Loss Prevention: Clubs invest in training and resources aimed at minimizing risks and improving safety standards among members15.
4. Legal Support: P&I Clubs often provide legal advice and assistance in maritime disputes

It is non-profitable club which covers following claims:

· Loss of life, injury & third party liabilities.
· Crew claims covering repatriations.
· Collision
· Wreck removal
· Damage to fixed and floating objects
· Pollution
· Cargo damage/shortage
· Fines
· Stowaways
· Other

Certificate of entry for P&I club

This certificate shows that ship is covered under the P&I club which has issued this certificate.

Is P&I insurance mandatory for all shipowners?

Yes. All shipowners who use their vessel for business or transportation, or for transporting passengers, workers, or cargo across international seas, must carry P&I insurance. To enter ports around the world, the master must provide a 'certificate of entry' given by the shipowners' respective P&I club, demonstrating their insurance to the port authorities.

How are claims paid in a P&I club?

When a claim is made, the claims handling team will determine whether the P&I policy covers it. If the claim is covered, the claims team will negotiate a settlement with the claimant and pay the claim. The P&I club will also consider any deductible that may apply.

Claim Cases

By Anuj Kumar

Function 3

1. Personal injury
2. Illness and death claims from crew or passenger and etc.
3. Stowaways and its repatriation arrangement.
4. Cargo Survey (TML etc)
5. Cargo claims for damage or loss of the same.
6. Damage caused to machinery or ship by stevedore
7. Unrecoverable GA contributions.
8. Liability due to collision
9. Damage to fixed and floating objects (Jetty, Pier, marine animals, Rig, Fishery Facility and etc)
10. Liability under approved towage contracts
11. Removal of wreck
12. Salvage operations
13. Civil liabilities imposed due to pollution or oil spill
14. Other fines

International Group P&I Club

Currently, the IG consists of 13 P&I clubs who between them provide marine liability cover (protection and indemnity) for approximately 90% of the world's ocean-going tonnage.

1. American Steamship Owners Mutual Protection and Indemnity Association, Inc
2. Skuld Mutual Protection and Indemnity Association (Bermuda) Ltd
3. Gard P&I (Bermuda) Ltd
4. The Britannia Steam Ship Insurance Association Limited
5. The Japan Ship Owners' Mutual Protection & Indemnity Association
6. The London Steam-Ship Owners' Mutual Insurance Association Limited
7. The North of England Protecting & Indemnity Association Limited
8. The Shipowners' Mutual Protection & Indemnity Association (Luxembourg)
9. The Standard Club Ltd
10. The Steamship Mutual Underwriting Association (Bermuda) Limited
11. Sveriges Ångfartygs Assurans Förening (The Swedish Club)
12. United Kingdom Mutual Steam Ship Assurance Association (Bermuda) Limited
(UK P&I Club).
13. The West of England Ship Owners Mutual Insurance Association (Luxembourg)

By Anuj Kumar

Function 3

Stability Requirements

Grain

Grain Stability

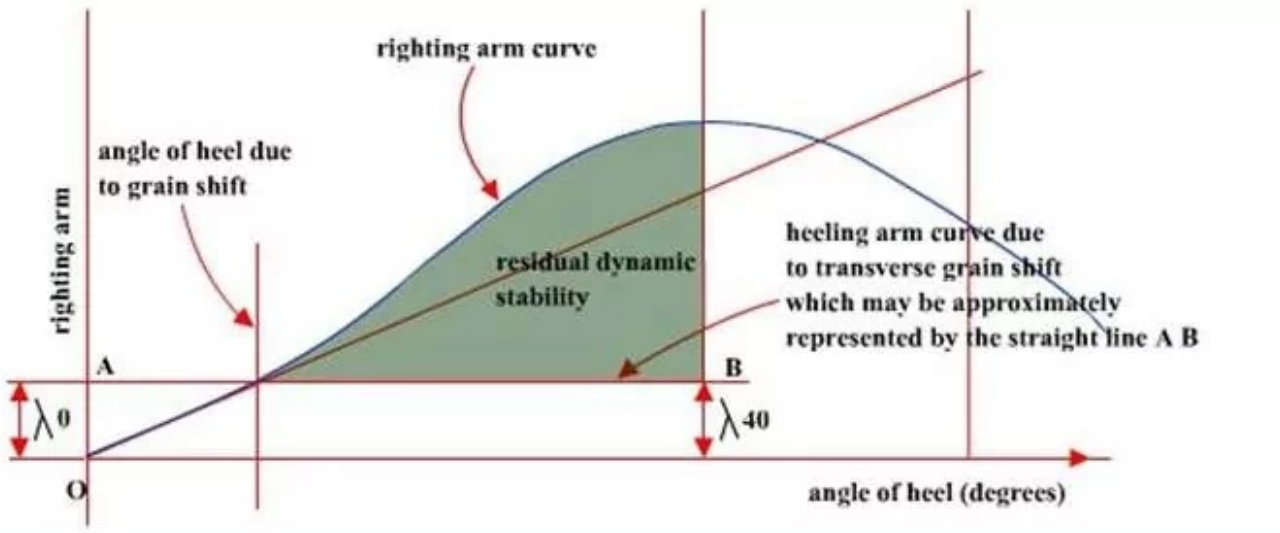
1. The angle of heel due to the shift of grain shall not be greater than 12 or in the case of ships constructed on or after 1 January 1994 the angle at which the deck edge is immersed, whichever is the lesser;

2. In the statical stability diagram, the net or residual area between the heeling arm curve and the righting arm curve up to the angle of heel of maximum difference between the ordinates of the two curves, or 40deg or the angle of flooding , whichever is the least, shall in all conditions of loading be not less than 0.075 metre-radians;

3. the initial metacentric height, after correction for the free surface effects of liquids in tanks, shall be not less than 0.30 m .

4.Before loading bulk grain the master shall, if so required by the Contracting Government of the country of the port of loading, demonstrate the ability of the ship at all stages of any voyage to comply with the stability criteria required by this section.

5.After loading, the master shall ensure that the ship is upright before proceeding to sea.



When can a ship load without a document of authorization?

When:

1.The total weight of the bulk grain shall not exceed 1/3 of the deadweight of the ship

2.All filled compartments, trimmed, shall be fitted with centreline divisions extending, for the full length of such compartments, downwards from the underside of the deck or hatch covers to a distance below the deck line of at least one eighth of the maximum breadth of the compartment or 2.4 m, whichever is the greater, except that saucers may be accepted in lieu of a centreline division in and beneath a hatchway except in the case of linseed and other seeds having similar properties;

3.All hatches to filled compartments, trimmed, shall be closed and covers secured in place

4.All free grain surfaces in partly filled cargo space shall be trimmed level and secured

5.Throughout the voyage the metacentric height after correction for the free surface effects of liquids in tanks shall be 0.3 m or that given by a formula given in the grain code

6.the master demonstrates to the satisfaction of the Administration or the Contracting Government of

the port of loading on behalf of the Administration that the ship in its proposed loaded condition will comply with the requirements of this section.

$$GM_R = \frac{L\ B\ Vd\ (0.25B - 0.645\ \sqrt{Vd\ B})}{SF\ x\ \triangle\ x\ 0.0875}$$

Where:

L = total combined length of all full compartments (metres)

B = moulded breadth of the vessel (metres)

SF = stowage factor (cubic metres per tonne)

Vd = calculated average void depth calculated in accordance with B.1 (metres - Note: not millimetres)

$\triangle$ = displacement (tonnes); and

Grain Stability Booklet

-Grain loading manual or Grain Stability Booklet are Class Approved information booklets which gives the ship's officer various information with respect to Grain Loading onboard

-Following are the contents of Grain Loading Booklet —

Contents:

Ship's Details: Particulars, lightship displacement, and KG values.

Free Surface Correction: Table with values for correction.

Hold Capacities: Capacities and Centre of Gravity of hold compartments.

Loading Notes: Instructions and guidelines.

Worked Example: For the Master's reference.

Typical Conditions: Service, loaded departure, and arrival conditions.

Volume and Heeling Moments: Curves/tables for each compartment, including temporary fittings.

Permissible Heeling: Tables/curves for varying displacements.

Stability Data: KN Curves and flooding tables for heel angles <40°.

Hydrostatic Properties: Curves or tables for operating drafts.

Stability Curves: Cross curves at 12° and 40° heel.

Temporary Fittings: Details of scantlings and fittings.

Timber Ships

Stability criteria - Cargo ships carrying timber deck cargoes

1. The area under the righting lever curve (GZ curve) shall not be less than 0.08 meter-radians up to θ= 40° or the angle of flooding if this angle is less than 40°
2. The maximum value of the righting lever (GZ) shall be at least 0.25 m
3. At all times during a voyage, the metacentric height GM shall not be less than 0.1 m, taking into

account the absorption of water by the deck cargo and/or ice accretion on the exposed surfaces.
4. When determining the ability of the ship to withstand the combined effects of beam wind and rolling, the 16° limiting angle of heel under action of steady wind shall be complied with, but the additional criterion of 80% of the angle of deck edge immersion may be ignored.

Container Ships

1. The initial metacentric height is to be equal to or greater than 0.20 m.
2. The area under the righting lever curve (GZ curve) in m. rad , is to be not less than 0.009m.rad upto angle of heel 30 degrees, and not less than 0.016 m.rad upto 40 degress or the angle of flooding if this angle is less than 40 degrees
3. The area under the righting lever curve (GZ curve) in m.rad. between the angles of heel of 30 degrees and angle of flooding , if this angle is less than 40 degrees or between 30 degrees and angle of flooding if this angle is 40 degrees , is to be not less than 0.006 m. rad.
4. The righting lever (GZ) in m is to be atleast, 0.033/c at an angle of heel equal to or greater than 30 degrees
5. The maximum righting lever GZ, in m is to be at least 0.042m.rad.
6. The total area under the righting lever curve(GZ curve) , in m. rad upto the angle of flooding is not to be less than 0.029/ c

General Cargo vessels

1. Initial GM or metacentric height should not be less than 0.15 m.
2. Righting lever GZ should be at least 0.2 m at an angle of heel greater than or equal to 30 degrees
3. Maximum righting lever should occur at heel not not less than 25
4. The area of the GZ curve should be at least :

0.055 m . rad upto angle of heel = 30 degrees
0.090 m. rad upto angle of heel = 40 degrees
0.03 m. radian upto angle of heel between 30 degrees and 40 degrees or between 30 degrees and angle of down flooding

Passenger Ships

1. The area under the righting lever curve (GZ curve) shall not be less than
- 0.055 metre-radians up to = 30°angle of heel
- not less than 0.09 metre-radians up to = 40° or
- the angle of down-flooding if this angle is less than 40°.
- Additionally, the area under the righting lever curve (GZ curve) between the angles of heel of 30° and 40° or between 30° and , if this angle is less than 40°, shall not be less than 0.03 metre-radians

2. The righting lever GZ shall be at least 0.2 m at an angle of heel equal to or greater than 30°.
3. The maximum righting lever shall occur at an angle of heel not less than 25°.
4. The initial metacentric height shall not be less than 0.15 m.
5. In addition, the angle of heel on account of crowding of passengers to one side as defined below shall not exceed 10°.

Function 3

A minimum weight of 75 kg shall be assumed for each passenger except that this value may be increased subject to the approval of the Administration. In addition, the mass and distribution of the luggage shall be approved by the Administration.
The height of the centre of gravity for passengers shall be assumed equal to
- 1 m above deck level for passengers standing upright. Account may be taken, if necessary, of camber and sheer of deck;
- 0.3 m above the seat in respect of seated passengers.
Passengers and luggage shall be considered to be in the spaces normally at their disposal

The angle of down flooding is an angle at which deck immersion takes place with subsequent water ingress.
The angle of flooding is an angle of heel at which openings in the hull , superstructure or deck houses which cannot be closed weather tight immerse

Tanker
Oil tankers of 5,000 tonnes deadweight and above Oil tankers, as defined in section 2 (Definitions) of the Introduction, shall comply with regulation 27 of Annex I to MARPOL 73/78.

Regulation 27 (Intact Stability) of Annex I to MARPOL 73/78:-
- In port, the initial metacentric height GM, corrected for the free surface measured at 0° heel, shall be not less than 0.15 m.
- At sea, the following criteria shall be applicable:
1.the area under the righting lever curve (GZ curve) shall be not less than 0.055 m·rad up to θ = 30° angle of heel and not less than 0.09 m·rad up to θ = 40° or
Other angle of flooding θf if this angle is less than 40°.
Additionally, the area under the righting lever curve (GZ curve) between the angles of heel of 30° and 40° or
between 30° and θf, if this angle is less than 40°, shall be not less than 0.03 m·rad;
2. The righting lever GZ shall be at least 0.20 m at an angle of heel equal to or greater than 30°;
3. The maximum righting arm shall occur at an angle of heel preferably exceeding 30° but not less than 25°; and
4. The initial metacentric height GM, corrected for free surface measured at 0° heel, shall be not less than 0.15m.

Damage Stability Oil Tankers
MARPOL Annex-1 Regulation 28 outlines the subdivision and damage stability criteria for oil tankers to ensure their safety and prevent pollution in case of damage.
The regulation specifies criteria for final waterline, angle of heel, and stability in intermediate and final stages of flooding.
Gross tonnage of 150 and above

Subdivision and Damage Stability Criteria
Final Waterline:

Function 3

- After damage, the final waterline (considering sinkage, heel, and trim) must be below the lower edge of any opening that could allow progressive flooding.
- Excludes watertight manhole covers, flush scuttles, small watertight cargo tank hatch covers, remotely operated watertight sliding doors, and non-opening sides-cuttles.

Angle of Heel:
In the final stage of flooding, the angle of heel due to unsymmetrical flooding must not exceed:
25° (may be increased to 30° if no deck edge immersion occurs)

Intermediate Stages of Flooding: The Administration must be satisfied that stability is sufficient during intermediate stages of flooding.

Final Stage of Flooding:
Stability is considered sufficient if:
- The righting lever curve has a range of at least 20° beyond the position of equilibrium.
- Maximum residual righting lever of at least 0.1m within the 20° range.
- Area under the curve within this range is not less than 0.0175 m·rad.

Unprotected openings must not be immersed within this range, unless the space is assumed to be flooded.
Equalization Arrangements: Mechanical aids (valves or cross-levelling pipes) must not be relied upon to reduce angle of heel or attain minimum residual stability.

Damage Stability Chem Tankers
IBC Code 2.9 - Survival req
Maximum Extent and Character of Assumed Damage
1. For Tankers Over 225 Meters in Length:
Damage may be assumed anywhere along the ship's length.

2. For Tankers Between 150 Meters and 225 Meters:
Damage may be assumed anywhere along the ship's length, except for either the after or forward bulkheads bounding the machinery space located aft.
The machinery space is treated as a single floodable compartment.

3. For Tankers Not Exceeding 150 Meters in Length:
Damage may be assumed anywhere along the ship's length between adjacent transverse bulkheads, with the exception of the machinery space.
For tankers of 100 meters or less in length, if fulfilling all requirements without impairing operational qualities is not possible, administrations may allow relaxations from these requirements

Survival Requirements:
1. At any stage of flooding
Final Waterline:

Function 3

- After flooding, the final waterline must be below the lower edge of any openings that could allow progressive flooding.
- This includes air pipes and other openings that are not watertight.

The intention is to prevent further water ingress that could compromise the vessel's stability and buoyancy

Angle of Heel:
The angle of heel due to unsymmetrical flooding must not exceed 25°. If no part of the deck is immersed, this angle may be increased to 30°. This requirement ensures that the vessel does not tilt excessively, which could lead to capsizing

Stability: The righting lever curve (GZ curve) must have a range of at least 20° beyond the position of equilibrium. This indicates that the vessel should have sufficient stability to return to an upright position after being heeled

Residual Stability:
The maximum residual righting lever must be at least 0.1 m within the 20° range from equilibrium. This ensures that there is enough stability to withstand external forces acting on the vessel

Area Under Curve:
The area under the righting lever curve within the 20° range must not be less than 0.0175 m·rad. This area quantifies the vessel's ability to resist capsizing after sustaining damage

- Unprotected opening Should not be immersed within this range unless the space is assumed to be flooded.

Q. Damage control plan & Damage stability booklet?

Damage Control Booklet & Damage Control Plan is also required as per SOLAS chapter II 1/ Regulation 19.

Damage stability booklet

Includes stability limiting values, cross flooding & down flooding arrangments and summaries of damage stability calculations. It also includes the ships main particulars such as length, breadth and depth.

Information in Damage Stability Booklet
1. Introduction:
General purpose and scope of the booklet. Reference drawings and diagrams.

2. Ship's Main Particulars:
Key dimensions such as:
Length Overall
Length between Perpendiculars
Breadth Moulded

Function 3

Depth Moulded and designed
Additional particulars relevant to stability calculations.

3. Damage Calculations:
Assessment of potential damage scenarios, including:
Side damage extent
Bottom damage extent
Breach of the outer hull

4. Loading Conditions:
Details on various loading conditions used in stability calculations.

5. Damage Cases:
Specific scenarios outlining different types of damage and their implications on stability.

6. Flooding Information:
Locations and specifications of flooding parts and air pipes.
Transverse Watertight Bulkheads:
Information on the arrangement and effectiveness of watertight bulkheads.

7. Damage Calculation Criteria:
Guidelines for evaluating damage stability based on regulatory requirements.

8. Calculation Summary Table:
A summary table presenting key calculations for quick reference.

9. Detailed Calculations of Damaged Cases:
In-depth calculations for each damage scenario, including effects on stability and required corrective actions.

10. Curves and Graphs:
Curves depicting minimum operational GM (metacentric height) versus draft.
Maximum allowable vertical center of gravity (KG) curves plotted against draft, which help assess compliance with stability criteria under various loading conditions.

11. Emergency Procedures:
Instructions for immediate actions to take in case of flooding, including closing watertight doors and monitoring tank soundings.

12. Cross-Flooding Arrangements:
Operational instructions concerning cross-flooding systems to manage water ingress effectively.

Damage control plan

By Anuj Kumar

Function 3

Includes information on the ships watertight subdivision, equipment, and penetration lines. It also shows how to limit flooding and restore stability. The plan should be available on bridge, CCR.

Information Included in a Damage Control Plan

1. Watertight Compartmentation:
A clear depiction of the boundaries of watertight compartments within the ship, including cargo tanks, ballast tanks, and fuel tanks.

2. Closing Mechanisms:
Details on all means of closing openings in the watertight compartments, such as valves, hatches, and watertight doors, along with their locations and operational controls.

3. Flooding Control Arrangements:
Information on systems designed to correct any list due to flooding, including the locations and capacities of ballast pumps and other equipment used for this purpose.

4. Emergency Procedures:
Instructions for immediate actions to take in case of flooding, such as closing watertight doors and assessing the safety of personnel on board.

5. Monitoring Systems:
Locations of sounding devices, air pipes, tank vents, and overflows that do not extend above the weather deck to monitor flooding effectively.

6. Piping Diagrams:
Diagrams showing the layout of piping systems related to bilge and ballast pumps, including control positions and associated valves.

7. Cross-Flooding Systems:
Locations and arrangements for cross-flooding systems that allow water to move between compartments to help balance the ship after damage.

8. Access Points:
Information on how to access watertight compartments for damage control parties during emergencies, including escape routes if necessary.

9. Location of Important Equipment:
Identification of all internal watertight closing appliances and their controls, along with position indicators and alarms for monitoring purposes.

General Instructions:
Guidelines on actions to take immediately following an incident, such as establishing communication with emergency response services and documenting tank soundings.

By Anuj Kumar

Function 3

The damage control plan must be clear, easily understandable, and presented in the working language of the ship. It should be readily accessible to all crew members involved in emergency response efforts to ensure effective action can be taken swiftly during a crisis

The understanding of a surface ship's stability can be divided into two parts.

Intact Stability -

This field of study deals with the stability of a surface ship when the intactness of its hull is maintained, and no compartment or watertight tank is damaged or freely flooded by seawater. Intact stability refers to a ship's ability to remain upright and return to an upright position after being tilted by external forces, such as wind or waves.

Damaged Stability - The study of damaged stability of a surface ship includes the identification of compartments or tanks that are subjected to damage and flooded by seawater, followed by a prediction of resulting trim and draft conditions.

Damage stability assesses a vessel's ability to remain afloat and stable after sustaining damage, such as flooding from a breach in the hull.

Damage stability criteria is the criteria or regulations made as minimum standard for the vessel to be still stable with various conditions of damage.

Criteria made on the basis of 3 methods

1. Deterministic method
2. Probablistic method.
3. Floodale length and factor of subdivision.

1. Deterministic Method

The deterministic method focuses on specific damage scenarios and provides minimum stability criteria that a ship must meet based on assumed damage.

The method specifies the extent and location of damage, allowing for precise calculations of stability factors.

It establishes minimum required values for stability factors at various stages of flooding, ensuring the vessel can survive under defined conditions.

This method is typically used during the design phase, where various loading conditions are assessed to ensure that the ship meets stability requirements under probable scenarios. The calculations often involve:

Considers the loss of buoyancy when compartments are flooded.

Accounts for the weight of water entering damaged compartments.

2. Probabilistic Method

The probabilistic method assesses a ship's stability based on statistical probabilities rather than fixed assumptions.

It uses two main probability factors:

The likelihood that specific compartments will be damaged (factor "p").

By Anuj Kumar

Function 3

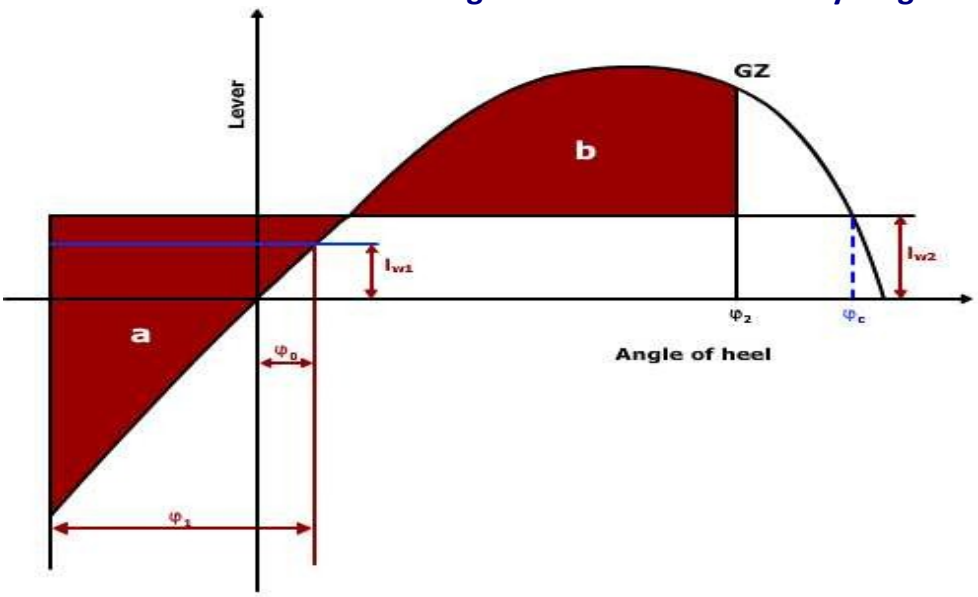
The chance that the ship will remain afloat if those compartments are flooded (factor "s") .
Compliance is determined by comparing the attained subdivision index against a required index, which reflects the overall safety level after potential damage. This index is calculated using various loading conditions and considers multiple damage scenarios .
This method allows for a more holistic evaluation of a vessel's safety, accommodating various potential damage situations without needing specific deterministic criteria for every case.

3. Floodable Length and Factor of Subdivision
This traditional approach lays the groundwork for understanding damage stability through compartmentalization:
Floodable Length: This is defined as the length of a compartment that, if flooded, would cause the ship to sink to its margin line. The floodable length curve helps determine how many compartments can be flooded before stability is compromised .
The number and arrangement of subdivisions (bulkheads) are calculated based on floodable lengths to ensure that flooding in one or more compartments does not lead to capsize or sinking.

Ships must be designed to survive flooding up to certain limits as indicated by their floodable length curves, ensuring that they can withstand breaches in their hulls without losing stability.

Worst case damage criteria is the situation on condition considered which has the least distance from the waterline to the opening through which progressive flooding can take place.

Severe wind and weather heeling criteria to be satisfied by cargo vessels



SEVERE WIND AND ROLLING CRITERION (WEATHER CRITERION)
The ability of a ship to withstand the combined effects of beam wind and rolling shall be demonstrated by complying with the weather criterion given below:
Steady Wind Criteria:
- It is assumed that ship will be subject to steady beam winds of ‘P’ i.e. 504 pascals
- Due to this, vessel will roll starboard side in this example producing heeling moment (lW1).

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Function 3

- As the vessel inclines, it will have a righting moment. The angle at which heeling moment is equal to righting moment is ϕ0.
- ϕ0 should not be more than 16° or 80% of angle of deck edge immersion whichever is less.

$$Lw1 = \frac{P \text{ X } A \text{ X } Z}{1000 \text{ X } g \text{ X } \Delta} \text{ (m)}$$

$$Lw2 = 1.5 \; x \; Lw1$$

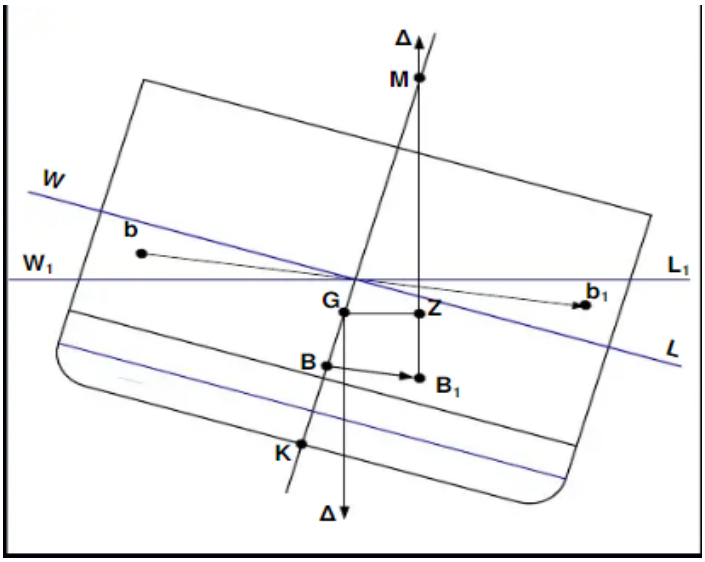
Where P- wind pressure of 504 pascals
A – protected lateral area of the ship & deck cargo above the waterline (m2)
Z – Vertical distance from the centre of A to the centre of the underwater lateral area or approximately to a point at one half the mean draft.
g- 9.81 m/s2

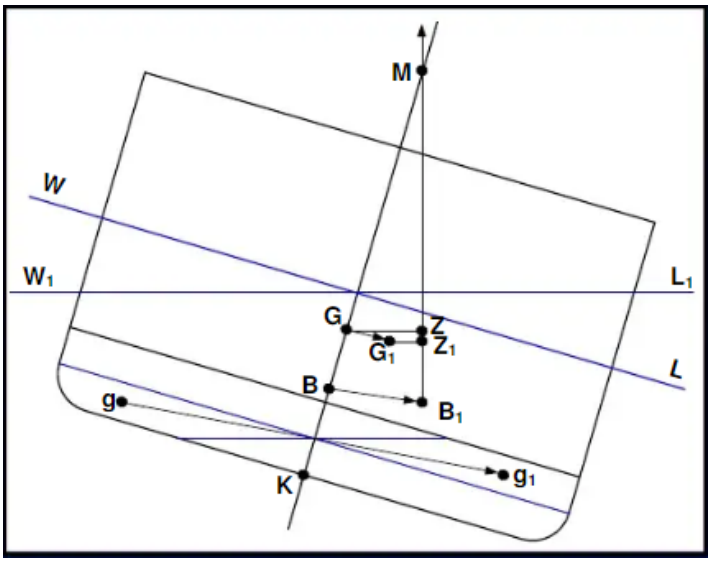
Wave & Gust effect:
Now the ship is assumed to roll windward from earlier condition, to port side in example due to wave effect from ϕ0 to ϕ1.
- Then, the ship is assumed to experience gust effect from port side in this example producing heeling moments which is 1.5 times lW1.
- And this heeling moment is represented as lW2.
- The area under the IW2 and GZ curve mentioned as ‘b’ in the diagram must be equal or greater than the area mentioned as ‘a’.
- Area ‘a’ is the amount of work required for the gust to roll the vessel to ϕ0.
- Due to the combined effect of wave and gust, the ship will roll until the area b is equal or more than area a.
- The angle up to which this rolling takes place is ϕ2.
- ϕ2 shall be at least 50° or angle of down flooding.
- ϕ2 shall not exceed ϕc plotted as shown in the diagram. This is the angle at which righting lever GZ will become zero.

Q. Free surface effect due to a slack tank

A partially filled tank is known as a “slack tank”. The reduction of stability caused by the liquids in slack tanks is known as free-surface effect.

Function 3





A)

- If a tank is completely filled with the liquid, the liquid cannot move and acts as a static weight. So, the centre of gravity of the ship remains unchanged.

-GM used here is GM solid.

- When the vessel in stable equilibrium is inclined by an external force, buoyancy is lost on the raised side and an equal amount created on the submerged side. This creates a shift of buoyancy from b to b1
- In the vessel, moving the overall buoyancy of the vessel along a parallel line from B to B1
- This creates a righting lever of GZ.
- As the ballast moves to the inclined side this causes a shift of weight of g to g1.

This causes a shift of the overall centre of gravity of the vessel G along a parallel line to a new position of G1. This reduces the righting lever to G1Z1

Explanation

If a perpendicular line is drawn upwards through G1 to the centre line of the vessel, the GZ can be redrawn between the centre line and the BM line. This gives G2Z2 which is equal to G1Z1

The distance along the centre line measured between G and G2 is the “virtual loss of GM”.

This is also known as the Free Surface Effect (FSE).

FSE = Sum of Free surface moments / Displacement

FSE does not depend upon the weight of liquid in the tank, providing the area of the free surface remains unchanged

FSE does not depend upon the position of the tank within the ship.

FSE is zero if a tank is full or empty.

Every slack tank contributes it‟s own FSE to the total FSE for the ship.

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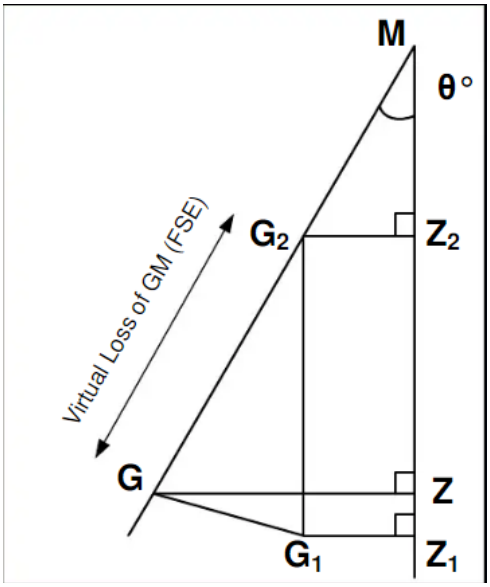
Function 3



Q. What are KN curves? How do KN Curves assist a Chief Mate of a vessel in determining the Intact Stability of a Ship?

Ans)

-The cross curves of stability were developed, so that, for any loading condition (where KG is already known), values of righting lever (GZ) can be obtained for all angles of heel.

-The curves are provided by the ship yard using SW displacement.

-These curves are same as GZ curve with only a difference that it is plotted for an assumed KG. i.e. KG = 0Mtrs.

KN being the righting lever measured from the keel.

-K is the Keel.

If at any angle of heel (Θ), a line parallel to that of GZ is drawn from 'K', then the point of intersection of this line with the vertical line of action of buoyancy, is represented as 'N'.

Expresssion for Righting lever is derived as

GZ = KN – KG Sin Θ

WHEN SHIP'S ACTUAL KG IS GREATER THAN ASSUMED KG THEN THEN SHIP IS LESS STABLE AND CORRECTION MUST BE SUBTRACTED.

-However, KN value is unknown, So, a computer generated plot of KN values for a range of displacements is obtained for different heel angles, and the resultant curves are collective called KN Curves or Cross Curves of Stability.

-Once the KN curves are obtained, it is now possible to obtain the stability curve / GZ curve for any loading condition.

-First, the loading condition is set, and the corresponding vertical center of gravity (KG) is obtained.

-The displacement of the ship for a particular loading condition is also available (from the hydrostatic curves).

-Once the displacement is fixed, a vertical line is drawn at the corresponding displacement on the KN curve.

Function 3

Eg. let's assume that the displacement for the given loading condition is 5000 tonnes. So, the line AA' is drawn through the KN curves, at 5000 tonnes.

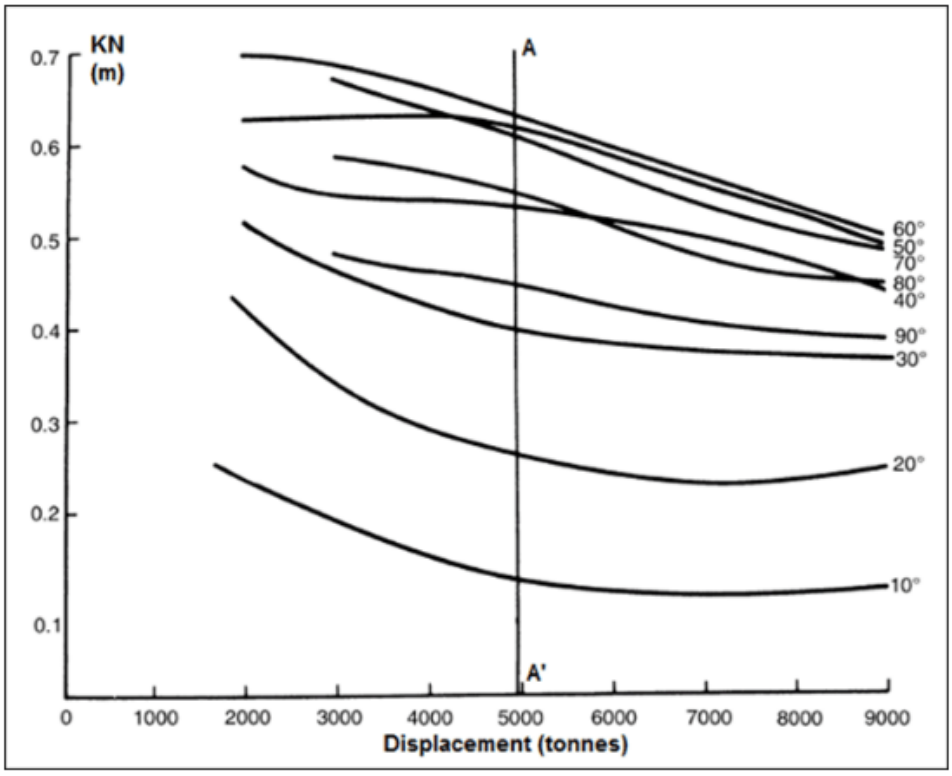


Figure 8: Cross Curves of Stability for a surface ship.

-The value of KN at each angle of heel is then replaced in the expression above, to obtain the GZ at each angle of heel.
-Once that is done, the designer obtains the GZ versus angle of heel values, which can be plotted to obtain the stability curve for a particular loading condition.

-The information Determined from the curves are
Initial Gm
Angle of flooding
Righting lever
Area under the GZ curve upto 30deg angle of heel etc.
These values help in determining the ship has met minimum intact stability criteria

Function 3

Misc.

Q. Equipment number? Why its used?

- The equipment number is a critical parameter used to determine the size and specifications of anchoring equipment for ships.
- The EN ensures that a vessel can be securely anchored under various environmental conditions, preventing drifting and potential accidents. It accounts for factors like wind and current forces that the vessel may encounter while anchored
- The EN calculation meets the regulatory requirements set by classification societies and maritime authorities, ensuring that ships are equipped according to recognized standards

- It helps in selecting adequately sized anchoring equipment, ensuring effective anchoring in different ports and harbors
- This calculation is essential for ensuring that a vessel is adequately equipped to anchor safely under various environmental conditions.
- The equipment number (EN) is calculated based on several factors:

Ship's Length (L): Overall length of the vessel.
Ship's Breadth (B): Maximum width of the vessel.
Depth (D): Vertical distance from the ship's deck to the bottom of the hull.
Displacement (Δ): Weight of water displaced by the vessel, usually measured in tonnes.
Windage Area: The area exposed to wind, which can affect stability and anchoring.
Service Area: The operational environment where the ship is expected to anchor

- The output from this calculation helps determine the appropriate specifications for anchors, chains, and other mooring equipment necessary for safe anchoring operations.

- Once the EN is known, a set of adequately sized equipment for mooring/anchoring of the vessel can be selected. Following are some equipment which can be selected based on EN:

Stockless bower anchors
Stud-link chain cables
Towlines – made of Steel of fiber ropes
Mooring lines – made of steel or fiber ropes

Q. What is inspection , Audit & Survey

An audit **measures the effectiveness of a system**.
An internal audit is carried out by the company, or by someone contracted to the company to carry out the audit on their behalf.
An external audit is carried out by the verifying authority; this is the flag state of the vessel, a different flag state at the request of the flag state of the vessel, or a recognised organisation (class society).
Audits can give rise to observations, non-conformities and major non-conformities

Observation: A previous version of the company permit to work form is being used.
Non-conformity: Some permits to work had have been closed properly.
Major non-conformity: No permit to work system has been implemented onboard.

Function 3

A survey leads to the issue of a certificate; it only looks at stated items that are relevant to that certificate. In that respect it has a narrower focus than an inspection or an audit but looks in greater detail.
Surveys are carried out by the flag state of the vessel, a different flag state at the request of the flag state of the vessel, or a recognised organisation (class society).
Surveys can give rise to deficiencies; these are recorded by the surveyor when found, and closed out once they have been rectified by the vessel. These must be closed out before a certificate can be issued.

An inspection is a general surface-level look at the condition of a ship;
An inspection is a systematic examination of a specific item, process, or system to determine its conformity to specified requirements. It typically focuses on identifying defects or non-compliance at a specific point in time. It is less in-depth than a survey. It covers multiple conventions and regulations and it is a sampling process.

Feature	Inspection	Audit	Survey
Objective	Determine conformity	Evaluate effectiveness	Assess compliance for certification
Scope	Narrow, item-specific	Broad, process-oriented	Focused on certification criteria
Nature	Quantitative	Qualitative	Detailed
Frequency	Regular (daily/weekly)	Scheduled (annual/semi-annual)	As needed for certification
Outcome	Immediate corrective actions	Recommendations for improvement	Issuance of certificates

Q. Ship maneuvering characteristics

The turning circle
1. Turn Circle: When a vessel alters her course under helm through 360° degrees, she moves on a roughly circular path called a turning circle. The circle will be a path traced out by the pivot point. Some refer to it as the path traced out by the centre of gravity.

2. Advance: The advance is the distance traveled by the centre of gravity along the original course.

3. Transfer: The transfer is the distance traveled by the centre of gravity from the original track measured in direction 90° to original heading.

Function 3

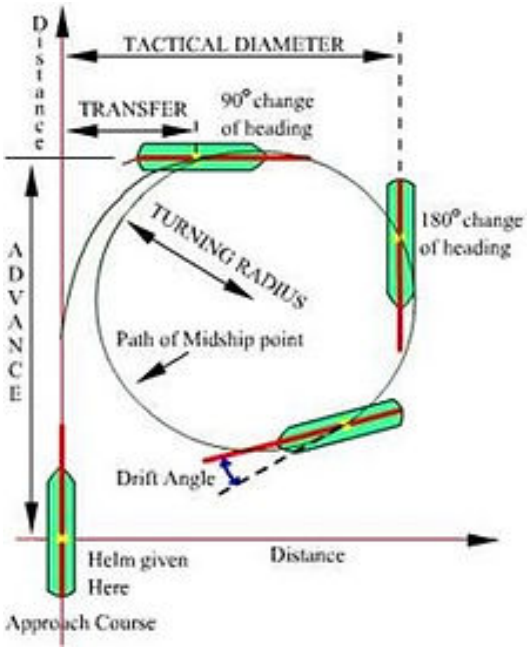
4. Tactical diameter: It is the transfer for 180°

5. The drift angle: It is the angle between the ship's fore and aft line and the tangent to the turning circle at any instant. Drift angle gives the correct idea of inward inclination of ship wrt. tangent.

6. Pivot Point: It is the point about which the vessel pivots i.e. the bow swings inwards & stern swings outwards. It is approximately one third of vessel's length from forward when going ahead. While going astern vessel pivots about a point approximately one quarter of length from astern.

Turning Moment in Turn Circle:
With the ship stopped in the water and the rudder hard to starboard, if an ahead movement is applied, the movement is initially resisted because of the inertia. This results in a pivot point well forward. The turning moment due rudder is maximum. When a steady speed is reached whilst turning, the pivot is at 1/3rd L from the bow.

Lateral Resistance
The relationship and balance between the rudder force and the lateral resistance decides the characteristic of turning circle. 1st 90 degree turn for a freighter will take 2 to 3 minutes. During initial 20 degree, the reduction of speed is not very great. Speed reduction is by 25% in the 1st 90 degree and by 33% in later part. The time taken to turn through a given angle depends on the initial speed and the angle of rudder applied. Usually the faster the speed and the greater the rudder angle the sooner will the turn be completed.



Track Reach is defined as a distance along the vessel's track that the vessel covers from the moment that the "full astern" command is given until ahead speed changes sign.

By Anuj Kumar

Function 3

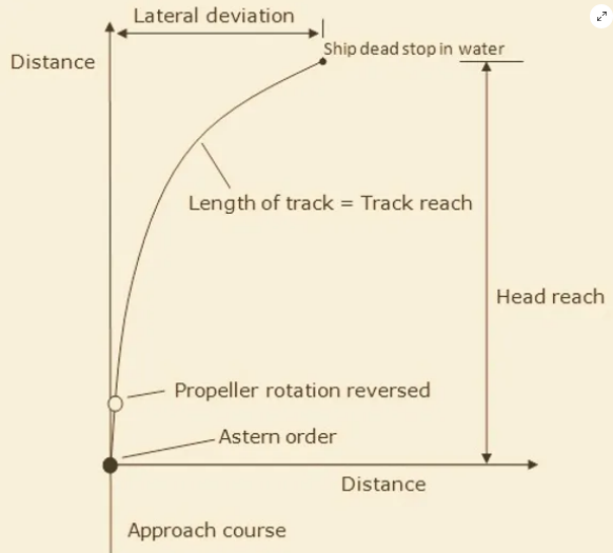
Head Reach is defined as a distance along the direction of the course at the moment when the “full astern” command was given. The distance is measured from the moment when the “full astern” command is given until the vessel is stopped dead in the water.

Track Reach Criterion

The stopping ability of the vessel is judged using a full astern crash stop maneuver. Based on IMO requirements the track reach should generally not exceed 15 ship lengths (measured along the path). However, in the case of low-powered large displacement vessels, this value may be modified, but in no case should exceed 20 ship lengths, subject to special consideration and approval by the Bureau.

Head Reach Criterion

Head reach criterion in a form of rating is based on statistics of sea trials.
Stopping ability rating only if:
TR < 20L only for low-powered large displacement vessel
TR < 15L in all other cases
where
TR = track reach, in meters
L = vessel length, in meters



Q. HOW TO TRAIN CADET ONBOARD

Training a cadet on a ship as a Chief Officer involves a structured approach that combines theoretical knowledge with practical experience.
- Ensure the cadet has completed STCW Basic Safety Training, which includes personal survival techniques, fire prevention, firefighting, and first aid.
- Introduce the cadet to ship operations, safety protocols, and emergency procedures.
This may include
1. Familiarization with the ship's layout and equipment,
2. Safety items and their use.

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Function 3

3. Duties in case of an emergency.
4. Muster point, alarms, emergencies
- Introduce key personnel, Meet department heads, officers, and crew members.

- 1st month of 1st ship is very critical as cadet has entered a new environment.
- Hold an initial meeting with cadet and ask him question relating to his “Pre-sea training” to get to know their knowledge, which gives an idea how and from where to start.
- Set clear objectives, Define training goals, expectations, and evaluation criteria.
- Create a Diary/weekly and monthly programme for them.
- Daily Report must be taken from them.
- Inspection of CRB weekly & Monthly to be taken.

- Under supervision, the cadet should learn basic watchkeeping responsibilities, including navigation practices and communication protocols.
- Involve the cadet in routine deck maintenance tasks, cargo operations, and mooring procedures to build hands-on experience.
- Train the cadet in advanced navigation techniques using modern navigational aids (e.g., ECDIS) and traditional methods (e.g., charts).
- Educate on cargo operations, including loading/unloading procedures, stability calculations, and securing cargo.
- Gradually increase responsibilities by allowing the cadet to lead small teams during operations under supervision.
- Conduct regular drills to prepare the cadet for emergency situations, emphasizing leadership roles during crises.

- Monitor their progress.
- Ensure that the cadet maintains a detailed training record book documenting their competencies and experiences throughout their training.
- Conduct periodic assessments of the cadet's performance, providing constructive feedback to aid their development.
- Ensure all competencies required for obtaining a Certificate of Competency (CoC) are met.
- Ensure they are self motivated to learn and perform job, & Foster a positive learning environment.
- Ensure that you are approachable guy & Encourage active participation and questioning.
- Monitor and ensure cadet's well-being and safety.

- Provide Resources
1. Company training manuals and guidelines.
2. Industry publications and regulations (e.g., IMO, ILO).
3. Online training resources (e.g., maritime courses, webinars).
4. Ship's library and training materials.

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Function 3

Q. HOW TO TRAIN SECOND OFFICER

Training a Second Officer (2/O) on ship requires a focused approach to enhance their skills, knowledge, and leadership abilities

- Review 2/O's certification, experience, and performance records.
- Familiarize with company training policies and regulatory requirements.
- Establish clear objectives and evaluation criteria.

- Navigation and Watchkeeping

1. Teach the importance of planning and monitoring the ship's route, including using navigational charts and publications effectively.
2. Ensure they understand emergency response protocols and can execute them calmly under pressure.

- Cargo Operations including practical assignments

1. Instruct on safe loading, discharging, and stowage of cargo, including understanding stability and ballast operations.
2. Emphasize the importance of maintaining accurate records of cargo operations and ensuring compliance with safety regulations.
3. Commercial awareness and chartering.
4. Cargo securing and lashing.

3. SMS & PMS

- Train on the inspection and maintenance of safety equipment, ensuring all gear is in good working order.
- Conduct regular safety drills and inspections to reinforce their role in maintaining safety standards onboard.
- Provide insights into routine maintenance schedules for deck equipment to enhance their technical understanding
- Taking part in Safety audits and inspections.
- Teaching about Budgeting and cost control.
- Ensuring undertsanding of Crew management and welfare

4. Leadership and Interpersonal Skills

- Develop their ability to lead small teams, emphasizing communication, motivation, and conflict resolution skills.
- Teach them how to remain calm and decisive in emergencies, fostering an environment where crew members feel supported.

5. Communication Skills

- Focus on both verbal and written communication skills, ensuring they can handle ship-to-ship and ship-to-shore communications clearly.
- Stress the importance of maintaining accurate logs of communications, navigational information, and operational activities.

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Function 3

7. Regulatory Knowledge
- Educate them on relevant maritime laws, international conventions (e.g., SOLAS, MARPOL, BWM), and company-specific policies, ISM and ISP procedures.
- Ensure they understand the standards set by organizations like the International Maritime Organization (IMO) regarding safety and operational practices.

-Encourage participation in additional training courses relevant to their career progression (e.g., advanced navigation, leadership skills).
- Foster a culture of mentorship where they can learn from experienced officers about best practices in ship management.

Q. Pooping and Broaching

POOPING:
- Pooping occurs when a vessel is in a large following sea and the speed of the waves is greater than the speed of the ship. The large waves may come onboard the vessel forcing her stern down.
- Pooping occurs when a vessel falls into the trough of a wave and does not rise with the wave, or if the vessel falls as the wave is rising and allows the wave to break over her stern or poop deck area. Hence the name 'pooping'.
- Vessels with a low freeboard are more exposed to the risk of 'pooping'.
- Pooping may cause considerable damage in the stern area and damage to propeller and rudder due to severe buffeting. Also, engine room can be flooded if the openings which face aft are not properly secured.
- Corrective action would be to alter course and head seas or heave to.

BROACHING TO:
- Broaching occurs when a vessel is in a large following sea and the speed of the ship is same as the wave speed. The ship will begin to 'surf' and become directionally unstable as there is no effective water running across the rudder.
- Broaching occurs when the ship's bow buries itself deep into the trough and the stern is swung round until the ship lies broadside to the waves.
- The ship once turned beam to the sea, begins to roll heavily, and if a following wave breaks upon her in such a way as to reinforce her roll to leeward, she may be heeled further over and capsize.
- Corrective action would be to reduce speed or to alter course and head seas.

Q. Parametric Rolling

Parametric rolling is a dynamic instability caused due to combination of various factors when a vessel is in motion.
As the wave crest travels along the hull, it results in flare immersion in the wave crest and the bow comes down. The stability (GM) varies as a result of the pitching and rolling of the ship. The combination of buoyancy and wave excitation forces push the ship to the other side.
A similar action takes place as the bow goes down in the next wave cycle resulting in synchronous motion which leads to heavy rolling up to 30 degrees in a few cycles. This type of rolling is known as Parametric rolling.

Function 3

- Particularly affects larger vessels (Large flare around water line such as Container ships and Pure Car/ Truck Carriers (PCTC).
- Parametric rolling is more when a ship is operating in heavy sea condition. The maximum roll happens when the bow is down.
- Ships which have a high GM will have a shorter roll period and unlikely to have parametric rolling in head/stern seas. Ships which have a low GM will have a long rolling period and are likely to have parametric rolling in head/stern seas.

Conditions for occurrence-
Phenomenon caused by wave-hull interaction. It occurs when
1. the sea condition is in the head/stern or anywhere near to them.
2. the time taken for rolling motion is equal to the time taken for pitching motion.
Wave length 0.5-1.0 x Vessel's length

3. larger flared sections around the waterlines when the time taken to encounter waves becomes equal to half the time taken for roll motion.
TE= TR or TE= 1/2 TR
TE = Encounter period, TR = Ship Roll Period

Effects of Parametric Roll- Dangers Associated with it
- Heavy stresses in ship structure especially in fore and aft parts
- Different rolling motion at fwd and aft produces torsional stress.
- Extreme stresses on the container and their securing system resulting in failure of the same and even
- loss of containers
- Unpleasant for the crew of the ship
- Variation in a load of ship’s propulsion engine
- If not tackled quickly, it can result in capsizing of ship

Prevention
- Use of active or passive stabilizers on board vessels.
Passive Stabilizers
1. Bilge keel – plates welded to hull, reduces water flow during rolling motion, hence produces damping the motion that reduces roll.
2. Passive tanks - tanks that are designed inside the vessel and they use ballast water to add and discharge weight as a means of counteracting the roll motion. If designed correctly, flow motions inside the tanks due to roll act as a damping force.

Active Stabilizers
1. Fin Stabilizers - They are movable lifting surfaces and are free to rotate about an axis. Its motion is governed by sensors to counteract external forces.
2. Gyro Stabilizers - Gyroscopic stabilizers produce a moment that can oppose the external forces thereby stabilizing the entire vessels.

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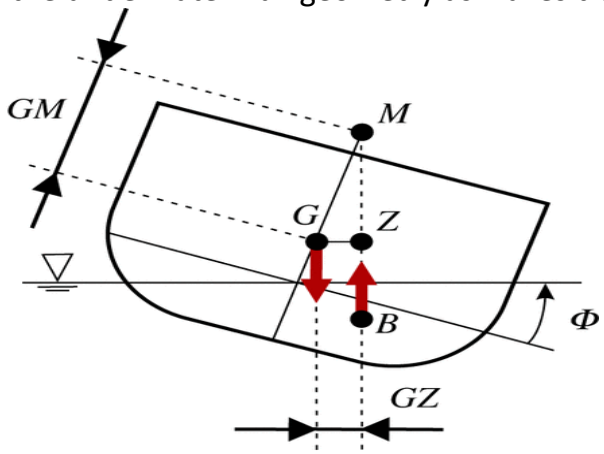
Function 3

Precautionary Measures During Parametric Rolling
- Maintain Correct GM – Not too stiff nor too tender.
Low GM – Extreme rolling motion
High GM – Stiff vessel
Take or remove ballast to change the value of KM/GMT.

- Adjust the heading and speed
Change the vessel's heading and adjust speed to bring vessel out of the dangerous zone of TE= TR or TE= 1/2 TR
- Deploy active stabilizers

Small Ships are not affected much because of their construction
- Not having a pronounced flare
- Small wall sided hull at mid section
- Small flat stern or not having flat stern.
- Bigger ships with above conditions, contribute to the variation of the ship's stability characteristics due to the constant change of the underwater hull geometry as waves travel past the ship.



Q. Synchronous Rolling
- Every vessel has a natural rolling period which is Inversely proportional to the square root of the GM and Directly proportional to the beam of the ship.
- Synchronous rolling is caused when the rolling period becomes 'synchronous' with the period of wave encounter. When this occurs, the ship will heel over and in exceptional circumstances be rolled further over by the action of the wave.
- If the vessel encounters a series of swell in such a manner that the wave period matches the natural rolling period, the vessel will have no time righting itself before the next wave strikes. This situation if not corrected, can result in capsizing of the ship.

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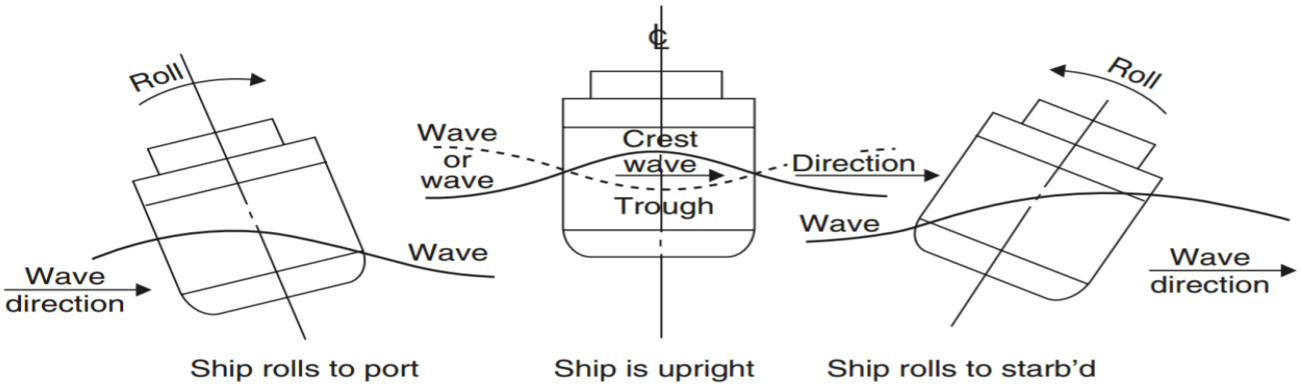
Function 3



Conditions for occurrence-

- This can happen regardless of the direction of the sea w.r.t. the ship's heading.
- When the natural rolling period of the ship is short
- When sailing in high beam or quartering seas

Precautionary Measures During Synchronous Rolling

- In order to avoid such situation either rolling period must change or the wave period.
- Adjust the ballast on board to reduce or increase the KG, so that GM would change, thereby changing thevessel's natural roll period.
- Change in heading shall be done so that there will be a change in the approaching wave frequencies. Alter the ship's speed until synchronism or resonance no longer exists with the wave frequency

Difference between Synchronous and Parametric Rolling

Parametric Rolling	Synchronous Rolling
Caused when period of pitching and period of wave matches.	Caused when period of rolling and period of wave matches.
Vessel's parameters such as GM and design causes such rolling.	Synchronous rolling is independent of vessel's parameters.
Mostly occurs when waves are nearly ahead or astern.	Mostly occurs when waves are abeam.
Angle of roll increases faster without any warning.	Amplitude of roll gradually rises and vessel may capsize.
Occurs only when the pitching is heavy enough for the flared bow to submerge when the ship pitches down by head.	Pitch is not associated with synchronous rolling.
Often seen only on containerships with large flare.	Synchronous rolling can occur with any type of vessel.
GM can be increased by taking ballast if possible, course/speed alteration can be done to break the sync with wave period.	Alteration of course will affect the wave period, andsynchronous rolling avoided.

Q. Heavy Weather Precautions

1. Check Anchor lashing, take extra lashing.
2. Secure Spurling pipe with cement.
3. All ventilators on forecastle deck shall be closed and secured.

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Function 3

4. Bobby hatch cleats to be closed tightly and secured.
5. Mooring ropes to be secured on drums with canvas around them.
6. Extra ropes to be taken in side forepeak store.
7. Secure everything inside forepeak store and paint store (if its Fwd).
8. Close and secure forepeak store weathertight door
9. Check cargo lashing and tighten as required.
10. Close all ventilators on deck and secure them
11. Hatch cleats should be checked and tightened.
12. Rig a life line on deck
13. Take extra lashing on accommodation ladder
14. Shift pilot ladders inside deck houses.
15. Check Cargo gears such as cranes derricks are parked and secured properly.
16. No Loose objects to be left on deck (such as wooden gratings)
17. Check all the Scuppers are open & Clear
18. Reduce Free Surface Effect by pressing up all the tanks
19. Take extra ballast if possible to reduce panting effect.
20. Check and Close all sounding pipes tightly
21. All items deck houses secured properly and doors closed and secured
22. Make sure all lashings of Life Saving appliances are tight and No Extra Lashing taken.
23. Secure poop deck - all vents, extra ropes and booby hatch secured properly.
24. Close all weather tights door on weather deck and tell crew not to go on deck without permission and informing bridge.
25. Call Engine room and tell them about expected weather and instruct them not to use steering flat door as they are fond of using that door.
26. Check steering gear for oil level and other unusual sounds, run both motors, sync Gyro repeater, test bridge - steering flat communication system and try out manual steering.
27. Engage crew in some productive task like securing and cleaning accommodation spaces.
28. Instruct Chief Cook about expected weather and secure galley.
29. Secure all the portholes and deadlights
30. Rearrange watch schedules as extra lookout may be required during restricted visibility and for hand steering.
31. Tryout both fwd and main mast ship's Whistle
32. Check weather forecast and ascertain ship's and storm's position.
33. Consider re-routing if required.
34. Update ETA
35. Log down all the events.

Q. ETA & ETB

- The requirements for Emergency Towing Arrangements are outlined in SOLAS (Safety of Life at Sea) Chapter II-1, Regulation 3.4, which mandates that all tankers of 20,000 DWT and above must have such arrangements at both ends of the vessel.

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Tankers, constructed before 01st July 2002,
1. Aft ETA should be capable of being deployed within 15 minutes.
2. Fwd ETA should be capable of being deployed within 60 minutes.
3. It should be possible to pick up the towing pennant manually without use of ship'spower.
4. All the equipments to be clearly marked and to be visible in night.
5. All the equipment should be properly maintained.

Tankers, constructed after 01st July 2002,
1. ETA should be capable of rapid deployment.
2. At least one ETA shall be pre rigged for rapid deployment without use of ships main power.
3. The strength of the ETA should be sufficient considering the size of the ship.

Strength Requirements:
- For tankers of 20,000 to 50,000 DWT: Minimum working strength of 1,000 kN.
- For tankers over 50,000 DWT: Minimum working strength of 2,000 kN.
- The design must accommodate all relevant towing angles and forces expected during operations
The strength should be sufficient for all relevant angles of towline, i.e. up to 90° from the ship's centerline to port and starboard and 30° vertical downwards.

Emergency Towing Booklet
The booklet will include the following:
- Drawings of the fore and aft decks showing possible emergency towing arrangements,
- The inventory of equipment provided onboard for emergency towing,
- Means and methods of communication, and
- Procedures for conducting an emergency towing operation.

A minimum of three copies of the Emergency Towing Booklet should be kept onboard, and these should be located at the forecastle, one inside the cargo control room/ship's office and one on the bridge.

Q. Strengthening members
Fwd members
1. Stem Plate or Stem Bar:
The vertical or slightly inclined plate at the very front of the ship, providing strength to the bow and acting as a barrier to water ingress.
2. Pillar:
Vertical support members that transfer loads from the deck above to the lower structures, crucial for maintaining stability and strength.
3. Wash Plate:
A plate designed to prevent water from entering the vessel through openings in the hull, typically located at the bow.
4. Wash Bulkhead:

Function 3

A bulkhead that helps manage water flow and pressure within the ship, particularly in rough seas, protecting internal compartments from flooding.

5. Collision Bulkhead:

A watertight bulkhead located at the forward end of the ship, designed to absorb impact forces during a collision and prevent flooding of adjacent compartments.

6. Panting Beams & Panting Stringer:

Structural members that provide additional strength to the hull against panting stresses (the flexing of hull plates due to wave action) at the bow.

7. Girder:

Heavy longitudinal members that run along the length of the ship, providing support and stiffness to the hull structure, particularly in areas subject to bending moments.

8. Side Frame:

Transverse frames that support the hull plating and contribute to overall structural integrity, helping to resist lateral loads.

9. Breast Hook:

A triangular or curved member connecting the stem to the side frames, enhancing strength at the bow and helping distribute loads.

10. Stiffener:

Reinforcing elements welded onto flat plates or shell plating to increase their load-bearing capacity and resistance to bending and buckling.

11. Alternate Beam:

Beams placed at intervals along the length of the ship, providing additional support and enhancing structural stability.

12. Bracket:

Supporting members often found between vertical and horizontal structures, helping distribute loads and maintain continuity in load paths.

Aft Members

Cant Beam:

A structural element that connects the deck to the hull at an angle, providing support and strength to the stern frame. Cant beams help distribute loads and resist bending moments caused by wave action.

Stern Frame:

The structural framework at the stern of the ship, which supports the transom and houses critical components like the rudder and propeller. It is designed to absorb forces from the propeller and provide stability.

Wash Plate:

A plate installed at the stern to prevent water from entering the vessel through openings in the hull. It helps manage water flow around the stern during operations.

Corrugated Bulkhead:

A bulkhead with a corrugated design that increases strength while reducing weight. It helps resist lateral pressures and enhances the overall rigidity of the aft structure.

Solid Floor:

Function 3

A continuous structural member that provides support across frames at the bottom of the ship. Solid floors help distribute loads evenly and contribute to the vessel's overall stability.

Panting Beam:

Reinforcing beams that help counteract panting stresses (the flexing of hull plates due to wave action) at the stern, ensuring structural integrity during rough sea conditions.

Transom Floor:

The floor structure located at the transom (the flat surface forming the stern) that provides additional support and helps distribute loads from the deck above.

Vertical Stiffeners:

Vertical members attached to bulkheads or other structures that enhance their load-bearing capacity. They help resist buckling and improve overall structural strength

Q. Emeregncy Response Service

The Emergency Response Service (ERS) was established in response to the Exxon Valdez accident and the subsequent introduction of the Oil Pollution Act of 1990 (OPA 90) in the USA.

The primary purpose of ERS is to assist ship owners in minimizing the negative consequences to both the vessel and the environment during emergency situations.
This service is designed to provide rapid and effective support to ensure safety and compliance with regulations.

The ERS provides prompt access to shore-based expert assistance for:
- Assessing damage stability and residual strength of vessels during emergencies.
- Responding to incidents such as collisions, groundings, structural breakdowns, fires, or explosions that impair a vessel's stability, strength, or seaworthiness.
- Addressing potential significant oil spills.

Emergency Situations Defined
An emergency response situation is defined as one where a vessel has suffered damage that affects its stability or seaworthiness. This includes:
- Damage from collisions or groundings.
- Structural failures.
- Fires or explosions.

Benefits of ERS
- 24/7 Availability: ERS offers around-the-clock professional assessment of a ship's condition during emergencies.
- Expert Guidance: A dedicated team of experts assists in making informed decisions when the crew and company are under stress.

Enrolling in ERS ensures compliance with:
- MARPOL Annex I, Chapter 5, Regulation 37(4): Pertaining to oil tankers.
- USCG Oil Pollution Act (OPA 90): Including relevant regulations such as 33 CFR 155.240 for damage

stability information.
- Assistance with the Shipboard Oil Pollution Emergency Plan (SOPEP).
- Adherence to the International Safety Management Code (ISM).

Q. Plans to Takeover from C/Off while joining

- ORB 1 & 2
- GRB & receipts & GMP
- CRB
- P& A manual / COW Manual.
- Cargo plan , Cargo Docs
- BWMP
- Cargo equipment certificates including loadicator
- Any Defect list
- Any PMS in progress

Q. Interaction in Narrow Channels

Ship to Ship: When passing another vessel that is moored fore and aft, interaction between the vessels will often cause the moored ship to 'range on her moorings'. Also, interaction between ships is experienced when they come very close to one another especially in shallow waters, in a passing or overtaking situation.

Ship to Shore: In a narrow channel such as a canal, when a vessel is navigating close to the bank, the interaction is experienced between the hull of the ship and sides of the bank. The vessel may experience the Bank Cushion effect at the bow and Bank suction effect at her stern.

Ship to ground: In shallow waters, an increase in squat may be experienced because of the loss of water under the vessel's keel leading to an interaction between the ship's bottom and the seabed. This may even bring about the vessel grounding. When a ship is nearing an extremely shallow depth of water, such as a shoal, she is likely to take a sudden sheer, first towards it and then violently away. This is called 'smelling the ground'. This is also a form of interaction between the ship and ground.

TURNING SHORT ROUND IN A NARROW CHANNEL:

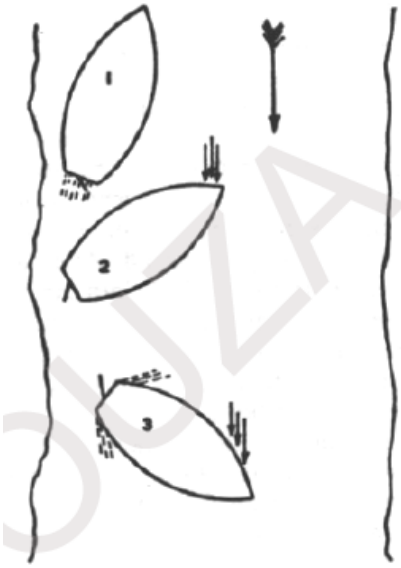
1. Begin the maneuver from the side of the channel that allows for maximum distance and leverage against currents or winds. For instance, if turning to starboard, start from the port side of the channel.

2. Recognize how your vessel's propeller affects its movement. The direction of transverse thrust (or propeller walk) will influence how your vessel turns:
A right-hand propeller typically causes the stern to move to port when going ahead and to starboard when going astern.
Use this characteristic to your advantage during the turn

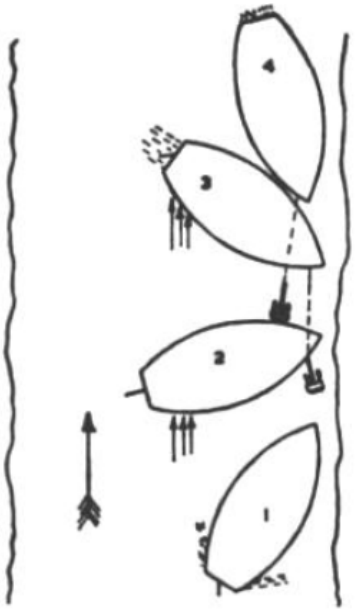
3. Executing the Turn:
Hard Over Helm: Immediately apply hard over helm in the desired direction (e.g., hard to starboard if

turning right). This action helps initiate the turn effectively.
Kick Ahead: Apply engine power (a "kick ahead") to generate forward momentum while maintaining control over the turn.
As the vessel begins to turn, monitor its movement closely. If necessary, stop or reverse the engine briefly to kill headway and allow for more precise control.

Upstream:
· The vessel is run close to the port-hand bank into slacker water and the bow given a cant into the fast water. (See o1)
· The swing develops. The stern must be kept as close to the port-hand bank as is prudent with stbd helm to assist the turn if required. (See 02)
· The engines must now be reversed fully (See 03) to prevent bodily downstream drift and the port helm must be used to complete the swing.
· In making the turn at the port bank, the transverse thrust is favourable throughout.



Upstream



Down Stream

Downstream:
· The vessel is run close to the stbd side bank into slacker water and the engine is reversed (01). The helm is hard over to stbd to cant inshore and is about to be placed to midship. The reversed engine produces a favourable transverse thrust and also prevents excessive lee drift.
· In (2) the upstream anchor is let go and held at short stay. This rapidly takes the bow to (3) by which time the engines must be worked ahead, under stbd helm to complete the swing to (4).
· The anchor is held at short stay so that excessive stress on the cable may cause it to dredge rather than be strained.
· The vessel seemed to have drifted further at (4) but in reality the vessel swings very nearly in her own length at (3).

General:
- Manoeuvre the vessel at slow speed to the port side

Function 3

Q. Girding of tugs

Girting refers to the situation whereby a tug is towed broadside by a towline and is unable to manoeuvre out of this position. This can occur during maneuvers or when the tug is subjected to significant towline forces, which can destabilize the vessel.

It is the capsizing moment of the tug due to the sudden movement of ships. The line is usually secured very near to the center of flotation and for this reason the tug is liable to be girded. This phenomenon is known variously as girthing, girding or girting, in differing parts of the world.

It can be caused by one, or both of the following:

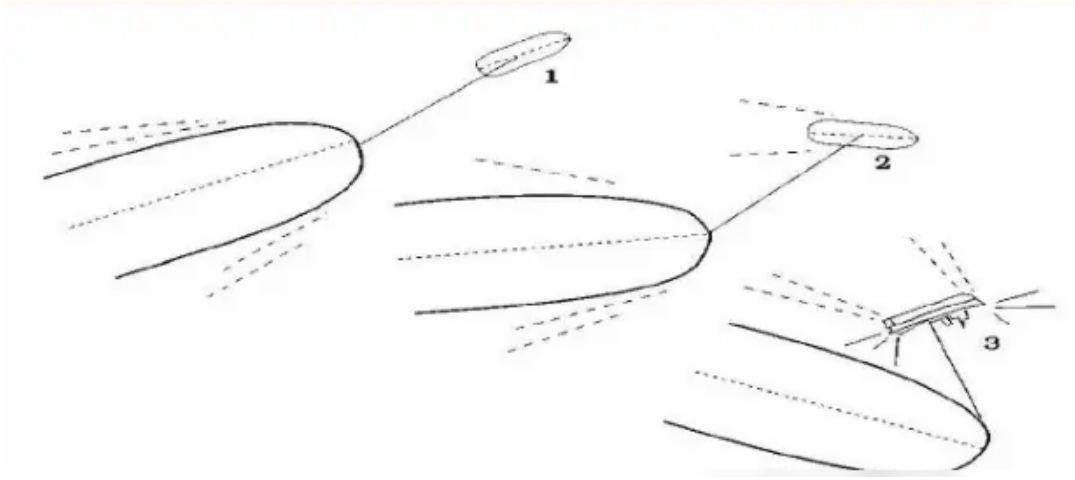
- The ship turning independently and too quickly away from the tug.
- Excessive straight line speed with a tug made fast.

Position 1 - in this area the tug is relatively safe and regardless of whether the ship's speed is too high it does not result in any immediate problem, provided it remains with a small angle on the bow. Whilst it can remain in attendance, such a small arc will naturally limit its operational capabilities.

Position 2 - if the tug is out in this position broad on the bow, the ship could, as a result of too much starboard helm or excessive speed, or both, outrun the tug which may have neither the time nor maneuverability to turn and keep up with the rapidly swinging or accelerating ship.

Position 3 - this is the worst possible situation where the tug is being pulled around on the radius of the tow line and because of the position of its hook, is then dragged along with the tow line out on its beam. Due to the nature of the forces involved, it will also be pulled over to a dangerous angle of heel. Unless the tow line breaks, or can be released immediately, the tug which is powerless to respond and already listing heavily, may capsize!

GIRTING OF TUG SECURED FORWARD



A conventional tug working aft, is perhaps more at risk than the forward tug as its design characteristics frequently oblige it to lay with the tow line much more inclined towards its beam.

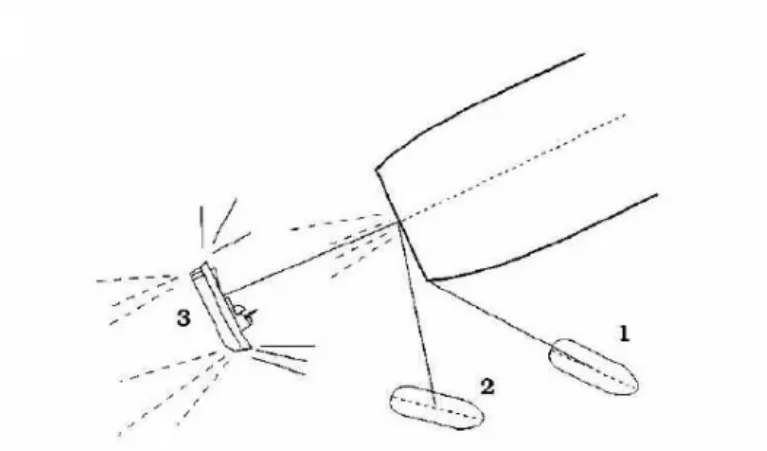
By Anuj Kumar

Function 3

Position 1 - provided the ship is either stopped or proceeding at extremely low speeds a conventional tug can work quite efficiently with maximum bollard pull in all directions at this and any other position around the stern.

Position 2 - if the ship's speed now increases, the tug will have to work around onto a heading which is more in keeping with the ship, not only to keep up with the accelerating ship but also to maintain a safe lead with the tow line. Here the tug master has to work with the tow line dangerously near the tug's beam. This position also results in substantial loss of bollard pull.

Position 3 - should the ship's speed become excessive or if the stern of the ship is swung rapidly away from the tug, it may be unable to respond quickly. As a consequence, the tug might be dragged around on the radius of the towline to this dangerous position and capsize with shocking rapidity.



The GOB Rope

This is a rope of suitable length and strength which a crewman will use on the towing deck to bowse down or 'gob down' the main tow rope and which may be adjusted in length as required. Its use brings the pivot point of the tug aft to the area of the gob rope and this encourages the tug to pivot around that point and keep its stern up to the tow

The use of a GOB rope minimizes the chances of girting, which occurs when a tug is pulled sideways by a towline at an angle, potentially leading to capsizing. By positioning the towing point further aft, the tug can maintain better control and stability

By Anuj Kumar