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Θέμα Πτυχιακής Εργασίας

“The Crew and how is recruited”

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INTRODUCTION

Around 90% of world trade is carried out by the international shipping industry which consists of many different shipping companies. Each shipping company specializes in transportation in one or even more cargo types. The most common type of cargoes is crude oil with its products being bulk cargo and general cargo. Those types of cargoes are being transported through various different shipping companies, and as a result high competition has been developed between them. Each company attempts to get the highest freight. This requires having a great reputation which for each company can only be built through fast and secure transportation network. Secured and high speed transportations, as before mentioned, can only be achieved through the efforts of an effective fleet, advanced technological structures and of course, human resources. Human resources include the crew and the staff who work in company offices but are not just limited there. They also include the Crew Management Department whose specialty is Crew changes on vessels and the Global Marine Organization, an Organization that regulates the rules procedures and requirements for the Crew and Crew Changing.

Such organizations are:

- IMO (International Marine Organization),
- STCW Convention (International Convention on Standards of Training, Certification and Watchkeeping for Seafarers),
- ILO (International Labor Organization),
- SOLAS (International Convention for the Safety of Life at Sea)
- MLC (Maritime Labour Convention)

1.1 Shipping is a growth industry

Shipping has such a major role in the import and export of goods on the scale of necessary, the modern world would be completely different from what we know today, if it ceased to exist. Seaborne trade continues to expand rapidly, bringing countless benefits for consumers worldwide through competitive freight costs. Thanks to the growing efficiency of shipping as a way of transport and increased economic liberalization, the prospects for the industry's further growth continue to rise. It is estimated there are over 50,000 merchant ships trading globally, transporting every kind of cargo. The world fleet is registered in over 150 nations, and manned by over a million seafarers of virtually almost every nationality.

Shipping is vital in world trade being the backbone of the world economy. Without the existence of ships and the transportation services these ships provide us with, the world would not be as prosperous as it is today's modern society and many countries would not be able to participate in world trade, which is as mentioned previously, an extremely significant part of global economy. In recent years, shipping has been proven to be a continually growing industry, witnessing the increase in gross tonnage of the world fleet by millions of tonnage every year. Since the worldwide economic downturn was set in late 2008, the interdependence of global economies has become a necessity. International trade – by any mode of transport – has been severely and immediately affected.

1.2 The Global Economic Role of Maritime Shipping

Marine transportation is an integral, most of the sometimes not publicly visible, part of the international economy. The marine transportation system is a network of specific specialized vessels, the ports they visit, and transportation infrastructure from factories to terminals and then to distribution centers and finally to markets. Maritime transportation is an absolutely necessary complement to and occasional substitute for other methods of freight transportation. For a lot commodities and known trade routes, there is no direct substitute for waterborne commerce. (Air transportation has replaced most ocean liner passenger transportation and transports significant cargo value, but carries only a tiny volume fraction of the highest value and lightest cargoes; while an important mode in trade value, aircraft moves much less global freight by volume, and energy per unit shipped.) On other different routes, such as some coastwise or short sea shipping

or within inland river systems, marine transportation may provide a substitute for roads and rail, depending upon cost, time, and infrastructure constraints. Other important marine transportation activities are passenger transportation (for example, ferries and cruise ships etc.), National Defense (Naval vessels), fishing and lastly resource extraction, and navigational service (vessel-assist tugs, harbor maintenance vessels, etc.).

Globalization, as a phenomenon, is too motivated by the recognition that resources and goods are not always collocated with the populations who desire or demand them, meaning that global transportation services become needed (and economically well-justified in case the consumer demand is high enough). For example, at the end of 1950s approximately, most crude oil was being refined at the source and transported to markets in a number of small tankers [sized between 12,000 and 30,000 deadweight tonnage (dwt)]. Nonetheless, economies of such scale soon started dictating the actions and choices of oil companies. A crucial change that was made back then was the handling by the oil companies, like larger amounts of crude being shipped from distant locations to refineries located closer to product markets. Product could then be more efficiently and efficiently distributed to points of consumption using a host of transportation modes. This realization ultimately led to the emergence of large tanker vessels (*e.g.*, greater than 200,000 deadweight tons) and drove down the per-unit cost of intercontinental energy transportation, changing the world of as we knew it.

In a similar way, rather than palletize grains, minerals, and other commodities, dry bulk cargo ships were designed to deliver cargoes in raw or semi-raw condition from where they were found or were purposely grown to processing facilities (*e.g.*, mills and bakeries) closer to final market. Along with containerization and advances in cargo handling and shipboard technology also, these measures helped reducing crew sizes and long-shore labor requirements while in addition reducing the per-unit cost of ocean cargo transport.

Furthermore, globalization caused labor market to be identified overseas, which encouraged transport of semi-raw materials and intermediate products where manufacturing costs were much lower. The low-cost petroleum energy for vessel propulsion, the facilitated by vessel economies of scale, the per-unit costs of semi-finished and the retail products, all combined, were steadily minimized by multi-continent supply chains. Today it is extremely common for agri-products to be harvested on one only continent and then shipped to another for intermediate processing or transported to a third continent for final assembly, for being delivered to market.

For instance, cotton grown in North America may be sent to African fabric mills, and then to Asian apparel factories before being returned to North America for sale in retail stores. Orange juice, wine, and other products have also found markets on continents where seasonal or climatic limitations require an offshore source or entered into competition with domestic production at higher labor costs. Those practices became much more common in the upcoming years.

Another trend immediately associated with the phenomenon of globalization is the pace at which trade occurs. Globalization has encouraged transactions of goods and services in minor packets being delivered “just-in-time”. This has increased the “velocity of freight” which justified in the 1970s faster, small containerized vessels, and over the last two decades justified faster, large containerized vessels. In a globalized economy, containerization offers the advantage of integrated freight transportation across all modes, which surely makes the everyday life much more easier and practical.

1.3 The Shipping Companies

A striking feature of the shipping business to outsiders is to differentiate character of the companies in the different parts of the industry. Such example is liner companies and bulk shipping companies belong to the same industry, although they seem to have little else in common. In fact, it's noteworthy that there are several different groups of companies involved in the transport chain, some directly and others indirectly. The direct players are the cargo owners, very often the primary producers such as oil companies or iron ore mines and the ship-owners (shipping companies). However, in the last 20 years they have been joined by two other worth-increasingly important groups: the traders who buy and sell physical commodities such as oil, for which they need transport, making them major charterers; and the ‘operators’ who charter ships against cargo contracts for an arbitrage. Ship managers and brokers are also involved in the day-to-day commercial operation of the business. Each one of them has a slightly different perspective on the business.

Those suppliers, including managers, ship repairers, shipbuilders, equipment manufacturers and ship breakers are a distinctive business with its own special culture and objectives. Ship finance forms another category, again with very distinctive subdivisions, as do lawyers and other associated services such as ship surveying, insurance and information providers.

1.4 Conclusion

In short, all these changes around Global Transport-Trading Industry have seriously in both a negative and a positive way affected the world shipping industry, and have led to providing many new requirements, policies and regulations of shipping companies' policies including the Crewing Management.

2.0 CREWING MANAGEMENT

2.1 What is crewing management?

Crew management for ships, otherwise known as crewing, are the services rendered by specialized shipping companies. Crew management services are an essential part of maritime and ship management that includes the management of all the various activities handled by crew on-board vessels, as well as related shore-based administration. Organizations that provide crew management services are known as crew management companies, or crewing managers, as commissioned by ship owners, ship managers, ship operators or charterers under a crew management contract. Major Global Shipping Companies have their own Crew Departments, but the minor companies usually request services from Crewing Companies.

2.2 Responsibilities of Crew Management – Crew Manager

Crew management companies (departments) are responsible for the human resources and manning of all types of vessels, utilizing their management offices, as well as a network of localized recruitment agencies based in key seafarer sourcing locations. Most commonly, these services include crew recruitment, deployment to vessel, scheduling, and regular training and development. Crew management companies (departments) are also responsible for taking care of on-going management and administrative duties of seafarers, such as payroll, travel arrangements, insurance and health schemes, overall career development, as well as their day-to-day welfare.

Commonly custom-built by crew management companies is used to manage activities and crewing-related data. This includes the scheduling of crew on- and off-board vessels, industry certifications and documentation, crew logistical aspects in travel arrangement and payroll/HR, crew training and upgrading schedules, as well as office administration tasks, such as performance assessments and statistical analyses, feedback, management and ship-owner reporting and invoicing, client online interface, and an integrated CRM.

Crew department responsibilities are mainly to ensure that ships are manned with adequate qualified, skilled certificated and medically fit seafarers in accordance with national and international requirements, as well as in line with the high standards of each company.

Those responsibilities in particular include -but are not limited only to- the following:

- Monitoring manning level and forecasting manning needs for all vessels.
- The identification of hiring/promotion needs as well as the determination of required qualifications and skills
- The final selection, engagement, administration and training of all seagoing personnel in co-operation with Ops and Technical dept. for top-4 officers
- Hiring of all shipboard personnel, directly, via authorized Manning Offices or via subcontracted Crew Managers
- Controlling and evaluating the performance of Manning Offices and sub-contracted Crew Managers
- Consistently evaluates the performance of all seafarers to ensure the above requirements.
- Maintains updated records for all seafarers employed by the Company.
- Follow up of Industry wages
- Setting and control of the annual Crew Budgets

Sea transport is carried out by a fleet of 74,000 ships. Since technology is constantly changing and improving, ships gradually wear out, the fleet is never optimum. It is a resource which the shipping market uses in the most profitable way it can. Once they are built, ships ‘trickle down’ the economic ladder until no ship-owner is prepared to buy them for trading, when they are scrapped.

3.0 CREW AND THEIR RESPONSIBILITIES

3.1 Captain

Captain who is also known as master is a licensed and ship's highest officer, he or she is a representative of the company, is in command of the vessel and is responsible for the safety of the crew, cargo and vessel itself. Whether the captain is a member of the deck department or not is a matter of some controversy, and generally depends on the company's policy. When a ship has a third mate, the captain does not stand watch. The captain is responsible for the day-to-day affairs of the ship as he/she is in command. That means that he take cares and keeps in check crew management, cargo operations, navigation and the general operations of the vessel to ensure maximum efficiency and safety on board, as well as ensures that the vessel complies with all the international and local laws and the policies of the company and flag's state. Every person on board starting from crew, staff members and officers and continuing to passengers, guests and pilot are under captain's responsibility and authority.

Captain duties and responsibilities

A captain on the vessel is in charge of all crew and procedures, which means that he has also the responsibility for everything and everyone. He control and guide everyone on the ship, ensuring the safe voyage of the ship, fastening and birthing, hygiene and cleanliness, safety and health of crew, crew management and training, cargo operations, ship's inventory and provision as well as ship's accounting and pays and for that reason in every vessel in captain's possession there is always an adequate amount of money for cash advance requests and draws.

The captain of the vessel must comply with immigration and custom regulations ensure that the ship has all the necessary documents and certificates that they are up to date and comply with the vessel's security plan as it is obligated by the International Maritime Organization. Immigration procedures include the embarkation and repatriation of the crew and passengers, handling cases of crew that deserted the ship, crew changes in port and accommodations for foreign crew members. Customs requirements can include the master providing a cargo declaration, a ship's stores declaration, and a declaration of crew members' personal effects, crew lists and passenger lists.

Ship's security plan content depends on the type of the ship and its needs, it states duties such as: inspections, search and patrol of restricted areas as well as responding to cases like refugee, and asylum seekers or threats from pirates, stowaways, saboteurs, hijackers and even terrorists.

The duties of captain include responding to any emergencies appropriately to the nature and the case of emergency and report ship's crew and passenger's medical state and conditions. Customs requirements can include the master providing a cargo declaration, a ship's stores declaration, and declaration of crewmembers' personal effects, crew lists and passenger lists. The captain has special responsibilities when the ship or its cargo is damaged, when the ship causes damage to other vessels or facilities, and in the case of injury or death of a crewmember or passenger. The master acts as a liaison to local investigators and is responsible for providing complete and accurate logbooks, reports, statements and evidence to document an incident.

Specific examples of the ship causing external damage include collisions with other ships or with fixed objects, grounding the vessel, and dragging anchor. Some common causes of cargo damage include heavy weather, water damage, pilferage, and damage caused during loading/unloading by the stevedores. In the end, captain is responsible to address any medical issues affecting the passengers and crew by providing medical care as possible, cooperating with shore-side medical personnel, and, if necessary, evacuating those who need treatment than can't be provided on board.

3.2 Chief Officer

Chief Officer is the Master's deputy or second in command and shall understudy Master in all aspects of his responsibilities. In case of death or incapacity of the Master, he shall take over the command of the vessel, till such time as he is suitably relieved.

He shall be responsible to the Master for all aspects of ship operation, which are described here and shall keep him fully informed about all matters pertaining to safety, security, cargo, stress and stability, stevedores, defects and non-conformities.

At sea, Chief Officer shall keep the 04:00-08:00 & 16:00-20:00 navigational watches. The watches adjusted by the Master or Chief Mate to ensure that the officers are adequately rested, and to take account of differing manning arrangements.

Chief Officer Responsibilities

1) Cargo and ballast

Chief Officer is designated cargo officer and responsible for safe planning, loading, storage, care and discharge of cargo. He shall supervise and direct the cargo operations ensuring the stresses and stability of the vessel are always within limits. He shall keep Master fully informed with all aspects of cargo care. He shall be responsible for ensuring and maintaining cargo worthiness of cargo containment prior loading.

2) Safety and security

Chief Officer shall be responsible for: carrying out the duties of a safety officer, if designated by the master, securing decks for proceeding to sea, he must ensure that the hatches, side doors and all openings are effectively closed. Making preparations on deck for arrival into a port or congested waters, ensuring searches carried out to detect if there are any stowaways or drugs and coordinating this search with other department heads as per ship security.

3) Environment Protection

Chief officer is responsible for the maintenance of oil spills response equipment and act as oil spill coordinator on oil tankers, maintaining the oil record book, as well as garbage management as per garbage management plan. They shall assist the master and the chief engineer in pursuing the objectives and targets assigned for the ship on environmental aspects, on ships certified to ISO 14001 standards.

4) Maintenance

Chief Officer is responsible for maintenance of LSA/FFA and safety equipment on deck and guiding the third officer in planning and carrying out the maintenance. Maintenance of the hull, decks, accommodation, tanks, void spaces, valves, and piping system he must make identification and maintenance of all critical equipment on deck, of the air condition, operation, maintenance and availability of all cargo equipment including hatch covers, lifting gear, cargo pipelines, cargo valves, deck seals, maintenance and repair works performed on deck and catering department, maintenance of aerials and riggings for electronic equipment on the bridge. He shall closely liaise with the Chief Engineer for repairs of any mechanical, hydraulic or electrical equipment of steel repairs and assist with manpower where necessary. Upkeep and maintenance of all deck stores ensuring compliance with the deck planned maintenance program and records.

5) Personnel Management

Chief Officer is the head of the deck department he shall be responsible for: ensuring compliance with safety and environment protection procedures by deck and shore personnel. Ensuring that a proper cargo/port watch is maintained by the duty officer under his supervision, the allocation of daily work of the deck crew and catering department. The assignment of jobs beyond scheduled working hours, preparing appraisal reports for deck and catering crew and advising Master on the performance of deck officers including appraisal reports.

6) Training and Drills

Chief Officer shall be responsible for:

- Training of Deck Cadets, trainee seamen, and trainees in the catering department.
- Planning and execution of safety training and emergency drill schedules.
- Safety familiarization of new joiners including supernumeraries.
- Job familiarization of deck and catering staff.
- Cargo familiarization of junior deck officers.
- Encouraging and guiding junior officers to learn and use the PMS relevant to their responsibilities

7) Administration and Record Keeping

The Chief Officer shall be responsible for:

The proper upkeep of the deck logbook and all reports concerning cargo, deck maintenance, and deck related Company reports. Inventory and consumption records of deck stores, spares, and paints. Preparation of requisitions for deck stores, spares, and paints and scrutinizes requisitions from other deck officer's prior submission to the Master. Receiving and signing for deck stores, spares, and paints and to ensure that the quality and quantity of items delivered conform to the order.

3.3 Second mate

A **second mate (2nd Mate)** or **second officer (2/O)** is a licensed member of the deck department of a merchant ship holding a Second Mates Certificate of Competency, which is issued by the administration. The second mate is the third in command (or on some ocean liners fourth) and a watchkeeping officer, customarily the ship's navigator. Other duties vary, but the second mate is in charge of maintaining distress signaling equipment. On oil tankers, the second mate usually assists the chief mate with the Cargo operations.

The Navigator's role focuses on creating the ship's passage plan. A passage plan is a comprehensive, step by step description of how the voyage is to proceed from berth to berth or one port to another. The plan includes undocking, departure, the en route portion of a voyage, approach, and mooring at the destination.

The GMDSS (Global Maritime Distress and Safety System) officer role consists of performing tests and maintenance, and ensuring the proper log-keeping on the ship's Global Maritime Distress Safety System equipment. Safety equipment includes Emergency Position-Indicating Radio Beacons, a NAVTEX unit, INMARSAT consoles, various radios, Search and Rescue Transponders and Digital Selective Calling systems.

3.3.1 Watchkeeping

A second mate is almost always a watchkeeper in port and at sea, the second mate is responsible to the captain for keeping the ship, its crew, and its cargo safe for eight hours each day. Traditionally, the second mate stands a "12-4" watch: from midnight until 4 a.m. and noon until 4 p.m. On watch, he must enforce all applicable regulations, such as safety of life at sea and pollution regulations. In port, the watch focuses on duties such as cargo operations, fire and security watches, monitoring communications, and the anchor or mooring lines.

IMO regulations require the officer be fluent in English. This is required for a number of reasons, such as to use charts and nautical publications, understand weather and safety messages, communication with other ships and coast stations, and to be able to work with a multi-lingual crew.

Sea watch

At sea, the mate on watch has three fundamental duties: to navigate the ship, to safely avoid traffic, and to respond to emergencies. Mates generally stand watch with able seaman who acts as helmsman and lookout. The helmsman executes turns and the lookout reports dangers such as approaching ships. These roles are often combined to a single helmsman/lookout and, under some circumstances, can be eliminated completely. The ability to smartly handle a ship is a key to safe watchstanding. A ship's draught, trim, speed and under-keel clearance all affect its turning radius and stopping distance. Other factors include the effects of wind and current, squat, shallow water, and similar effects. Shiphandling is a key when the need arises to rescue a man overboard, to anchor, or to moor the ship.

The officer must also be able to transmit and receive signals by Morse light and to use the International Codes of Signal.

Officer in charge of navigational equipment and other aids to navigation

On the ship the second officer is the officer that works under the Master, i.e. the Captain of the ship and shoulders the responsibility of checking the functionality of all the navigational equipment, such as the Echo-sounder, RADAR, ECDIS, AIS, and on some vessels even the GMDSS radio equipment, however recently it has been observed that Companies tend to designate the responsibility of maintaining the GMDSS equipment to the third officer. These checks are made in according to the companies planned maintenance system. In addition these checks are usually made prior to arrival and departure ports.

Often if any navigational equipment is suspected of being faulty then it should be checked that the equipment is in working order as per the given performance standards. Correction of Navigation Charts and the duties of keeping the charts up to date rest on the Second mate. These corrections are received in the Weekly/Monthly/Annual Notices to Mariners, if Admiralty Charts are used on board. Corrections are to be made using the standard Symbols from Chart 5011. Admiralty Publication NP 294 How to Keep Charts Up to Date should be used as a reference to maintenance of charts. However due to the introduction of the ECDIS in a phased manner that is due to be introduced on most Merchant Vessels by 2018, manual correction of charts is fast becoming obsolete. ECDIS has ushered in the age of SENC Vector Charts these charts can be updated remotely by the broadcasts of the service provider, provided that the ship is connected to the Internet. Corrections may also be received via email, or Correction CD's depending on the service provider and your needs.

3.3.2 Navigation

While a ship is under way, the officers navigate it, typically in three shifts or watches. Celestial, terrestrial, electronics, and coastal navigation techniques are used to fix a ship's position on a navigational chart. Accounting for effects of winds, tides, currents and estimated speed, the officer directs the helmsman to keep tracking. The officer uses supplemental information from Nautical Publications, such as sailing directions, tide tables, Notices to Mariners, and radio navigational warnings to keep the ship clear of danger in transit.

Safety demands the mate be able to quickly solve steering control problems and to calibrate the system for optimum performance. Since magnetic and gyrocompasses show the course to steer, the officer must be able to determine and correct for compass errors.

Weather's profound effect on ships requires the officer be able to interpret and apply meteorological information from all available sources. This requires expertise in weather systems, reporting procedures, and recording systems.

Traffic Management

The International Regulations for Preventing Collisions at Sea are a cornerstone of safe watch keeping. Safety requires that one live these rules and follow the principles of safe watch keeping. Maximizing bridge teamwork, including Bridge Resource Management is an emerging focus in watch keeping.

The main purpose for Radar and Automatic Radar Plotting Aids (ARPA) on a ship's bridge is to move safely among other vessels. These tools help to accurately judge information about prominent objects in the vicinity, such as:

- range, bearing, course and speed
- time and distance of closest point of approach
- course and speed changes

These factors help the officer apply the COLREGS to safely maneuver in the vicinity of obstructions and other ships.

Unfortunately, radar has a number of limitations, and ARPA inherits those limitations and adds a number of its own. Factors such as rain, high seas, and dense clouds can prevent radar from detecting other vessels. Conditions such as dense traffic and course and speed changes can confuse ARPA units. Finally, human errors such as inaccurate speed inputs and confusion between true and relative vectors add to the limitations of the radar/ARPA suite.

The radar operator must be able to optimize system settings and detect divergences between an ARPA system and reality. Information obtained from radar and ARPA has to be treated with scrutiny: over reliance on these systems has sunk ships. The officer must understand system performance. Examples include limitations and accuracy, tracking capabilities and limitations, and processing delays, and the use of operational warnings and system tests.

3.3.3 Emergencies

Emergencies can happen at any time, and the officer must be equipped to safeguard passengers and crew. After a collision or grounding, the officer must be able to take initial action, perform damage assessment and control, and understand the procedures for rescuing persons from the sea, assisting ships in distress, and responding to any emergency which may arise in port.

The officer must understand distress signals and know the IMO Merchant Ship Search and Rescue Manual.

3.3.4 Cargo handling

The ship's officer must be able to oversee the loading, stowage, securing and unloading of cargoes. Requirements include understanding the care of cargo during the voyage.

Of particular importance is knowledge of the effect of cargo including heavy lifts on the seaworthiness and stability of the ship. The officer must also understand safe handling, stowage and securing of cargoes, including cargoes that are dangerous, hazardous or harmful.

Controlling ship operations

The officer has special responsibilities to keep the ship, the people on board and the environment safe. This includes keeping the ship seaworthy during fire and loss of stability, and providing aid and maintaining safety during man overboard, abandoning ship, and medical emergencies.

Understanding ship's stability, trim, stress, and the basics of ship's construction is a key to keeping a ship seaworthy. Competencies include knowing what to do in cases of flooding and loss of buoyancy. Fire is also a constant concern. Knowing the classes and chemistry of fire, fire-fighting appliances, and systems prepares the officer to act fast in case of fire.

An officer must be expert in the use of Survival craft's and Rescue boats, their launching appliances and arrangements, and their equipment including radio life-saving appliances, satellite EPIRB's, SART's, immersion suits and thermal protective aids. It's important to be expert in the techniques for survival at sea techniques in case it's necessary to abandon ship.

Officers are trained to perform medical tasks and to follow instructions given by radio or obtained from guides. This training includes what to do in case of common shipboard accidents and illnesses.

3.4 Third Mate

A **third mate (3/M)** or **third officer** is a licensed member of the deck department of a merchant ship. The third mate is a watch stander and customarily the ship's safety officer and fourth-in-command (fifth on some ocean liners). The position is junior to a second mate. Other duties vary depending on the type of ship, its crewing, and other factors.

Duties related to the role of safety officer focus on responsibility for items such as firefighting equipment, lifeboats, and various other emergency systems.

3.4.1 Watchstanding

International Maritime Organization (IMO) regulations require the officer be fluent in the English language. This is required for a number of reasons. Examples are the ability to read charts and nautical publications, understand weather and safety messages, communicate with other ships and coast stations, and to successfully interact with a multi-lingual crew.

3.4.2 Emergencies

Emergencies can happen at any time and any place. The officer must be ready at all times to safeguard passengers and crew. After a collision or grounding, the mate must be able to take initial action, perform damage assessment and control, and understand the procedures for rescuing persons from the sea, assisting ships in distress, and responding to any emergency which may arise in port.

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Officers are highly-trained to perform medical tasks and to follow instructions given by radio or obtained from guides. This training includes what to do in case of common shipboard accidents and illnesses.

3.4.4 Sea watch

At sea, the mate on watch has three fundamental duties: to navigate the ship, to safely avoid traffic, and to respond to any emergencies that may arise. Mates generally stand watch with able seamen who act as helmsman and lookout. The helmsman executes turns and the lookout reports dangers such as approaching ships. These roles are often combined to a single helmsman/lookout and, under some circumstances, can be eliminated completely. The ability to smartly handle a ship is key to safe watchstanding. A ship's draught, trim, speed and under-keel clearance all affect its turning radius and stopping distance. Other factors include the effects of wind and current, squat, shallow water and similar effects. Ship handling is key when the need arises to rescue a person overboard, to anchor, or to moor the ship.

The officer must also be able to transmit and receive signals by Morse light and to use the International Code of Signals.

Navigation

While a ship is underway, the officers navigate it, typically in three shifts or watches. Celestial, terrestrial, electronic, and coastal navigation techniques are used to fix a ship's position on a navigational chart. Accounting for effects of winds, tides, currents and estimated speed, the officer directs the helmsman to keep tracking. The officer uses supplemental information from nautical publications, such as Sailing Directions, tide tables, Notices to Mariners, and radio navigational warnings to keep the ship clear of danger in transit.

Safety demands the mate be able to quickly solve steering control problems and to calibrate the system for optimum performance. Since magnetic and gyrocompasses show the course to steer, the officer must be able to determine and correct for compass errors.

Weather's profound effect on ships requires the officer be able to interpret and apply meteorological information from all available sources. This requires expertise in weather systems, reporting procedures and recording systems.

Traffic management

Avoiding collisions can be challenging in heavy traffic.

The International Regulations for Preventing Collisions at Sea are a cornerstone of safe watchkeeping. An emerging focus in watchkeeping is maximizing bridge teamwork, including the practice of Bridge Resource Management.

The main purpose for Radar and Automatic Radar Plotting Aids (ARPA) on a ship's bridge is to move safely among other vessels. These instruments help to accurately judge information about prominent objects in the vicinity, such as:

- range, bearing, course and speed,
- time and distance of closest point of approach, and
- course and speed changes.

These factors help the officer apply the COLREGS to safely maneuver in the vicinity of obstructions and other ships.

Unfortunately, radar has a number of limitations, and ARPA inherits those limitations and adds a number of its own. Factors such as rain, high seas, and dense clouds can prevent radar from detecting other vessels. Moreover, dense traffic and course and speed changes can confuse ARPA units. Finally, human errors such as inaccurate speed inputs and confusion between true and relative vectors add to the limitations of the radar/ARPA suite.

Under the best conditions, the radar operator must be able to optimize system settings and detect divergences between an ARPA system and reality. Information obtained from radar and ARPA must be treated with scrutiny: over reliance on these systems has sunk ships. The officer must understand system performance, limitations and accuracy, tracking capabilities and limitations, and processing delays, and the use of operational warnings and system tests.

In-port watch

In port, the watch focuses on duties such as cargo operations, fire watches, security watches, monitoring communications, and monitoring the anchor or mooring lines.

3.4.5 Cargo handling

The ship's officer must be able to oversee the loading, stowage, securing and unloading of cargoes. He must also understand the care of cargo during the voyage.

Of particular importance is knowledge of the effect of cargo including heavy lifts on the seaworthiness and stability of the ship. The officer must also understand safe handling, stowage and securing of cargoes, including cargoes that are dangerous, hazardous or harmful.

3.5. Safety Officer

The third mate is usually responsible for the upkeep of lifesaving and firefighting equipment. This includes a responsibility for some or all of the ship's boats, and particularly the lifeboats.

The third mate is also generally an active participant in fire and boat drills.

3.6 Deck Cadet

A **Deck Cadet** or Trainee Navigational Deck Officer or Nautical Apprentice is an apprentice who has to learn the basic duties of a deck officer onboard a ship. The cadet has to complete the prescribed sea-time in order to take the exams of the second mate. Even though the cadet is on board they still have to complete their studies. They have to undergo various forms of training, watch-keeping with chief officer, at port with second mate and normal deck jobs with the Bosun.

Training

Before joining onboard the cadets have to undergo various training. Every cadet successfully complete Basic STCW certifications mainly **Basic safety Training (BST)** and **security training for seafarers with designated security duties**. The cadets may also need to undergo various Ship specific training as per the requirements. Basic safety Training is a mandatory training for every seafarers as per the STCW CONVENTION

3.7. Bosun

A **boatswain**, known as a **Petty Officer, deck boss**, or a **qualified member of the deck department**, is the senior rate of the deck department and is responsible for the components of a ship's hull. The boatswain supervises the other members of the ship's deck department, and typically is not a watch stander, except on vessels with small crews. Additional duties vary depending upon ship, crew, and circumstances.

Job description

The boatswain works in a ship's deck department as the foreman of the unlicensed (crew members without a mate's license) deck crew. Sometimes, the boatswain is also a third or fourth mate. A boatswain must be highly skilled in all matters of marlinespike seamanship required for working on deck of a seagoing vessel. The boatswain is distinguished from other able seamen by the supervisory roles: planning, scheduling, and assigning work.

As deck crew foreman, the boatswain plans the day's work and assigns tasks to the deck crew. As work is completed, the boatswain checks on completed work for compliance with approved operating procedures.

Outside the supervisory role, the boatswain regularly inspects the vessel and performs a variety of routine, skilled, and semi-skilled duties to maintain all areas of the ship not maintained by the engine department. These duties can include cleaning, painting, and maintaining the vessel's hull, superstructure and deck equipment as well as executing a formal preventive maintenance program. A boatswain's skills may include cargo rigging, winch operations, deck maintenance, working aloft, and other duties required during deck operations.

The boatswain is well versed in the care and handling of lines, and has knowledge of knots, hitches, bends, whipping, and splices as needed to perform tasks such as mooring a vessel. The boatswain typically operates the ship's windlasses when letting go and heaving up anchors. Moreover, a boatswain may be called upon to lead firefighting efforts or other emergency procedures encountered on board. Effective boatswains are able to integrate their seafarer skills into supervising and communicating with members of deck crew with often diverse backgrounds.

Originally, on board sailing ships the boatswain was in charge of a ship's anchors, cordage, colors, deck crew and the ship's boats. The boatswain would also be in charge of the rigging while the ship was in dock. The boatswain's technical tasks were modernized with the advent of steam engines and subsequent mechanization.

A boatswain also is responsible for doing routine pipes using what is called a boatswain's call. There are specific sounds which can be made with the pipe to indicate various events, such as emergency situations or notifications of meal time. A common slang name for this instrument was the pippity dippity

3.8. Pump man

A **pump man** is an unlicensed member of the Deck Department of a merchant ship. Pump men are found almost exclusively on tankers and on oil tankers in particular. Variations on the title can include **chief pump man**, **QMED/pump man**, and **second pump man**.

A pump man performs all work necessary for the safe and proper operation of the liquid cargo transfer system.¹ This includes but is not limited to: liquid cargo transfer pumps, liquid cargo stripping pumps, liquid cargo coalesces and separators, strainers, filters, associated piping, valves, fittings, and deck machinery directly related to the transfer of liquid cargo.

3.8.1 Maintenance

The pump man's job is to keep the liquid cargo system on a tanker running. The liquid cargo system consists of several components. A major component is the pumps themselves, including not only the liquid cargo transfer pumps but also the liquid cargo stripping pumps. Another component consists of the equipment that conditions the cargo, including liquid cargo coalesces and separators, strainers, and filters. The third component consists of all the piping, valves, fittings, and deck machinery directly related to the transfer of liquid cargo.

Pump men also maintain the cargo lines and connection manifolds. The pump man's job has three aspects: repairing equipment when it breaks, monitoring equipment to ensure it is working, and maintaining equipment to prevent breakage. Many organizations, such as the United States Navy use planned- and preventive-maintenance systems to guide the pump man in identifying and scheduling required maintenance actions.

Some common activities include rebuilding valves pumps and correcting leaks in the cargo system. Pump men also often repack valves and glands. Pump men also spend a lot of time lubricating parts, such as glands, bearings and reach rods.

On some ships, pump men are responsible for the ballast system, room heating systems, and other engine department duties.

3.8.2 General Duties

Those that work aboard ships have general duties, in addition to their job-specific duties. For the pump man, this largely translates to proficiency during drills and actual emergencies. The pump man will participate in shipboard drills such as engineering casualty drills, fire drills, and collision drills, and must be able to perform assigned duties and carry out instructions safely and efficiently. As a non-entry level rating, the pump man is expected to take the initiative in emergencies without specific orders or instructions, and have a complete knowledge of safety policies and practices. Some policies that are particularly important to the pump man rating include handling of flammable/dangerous liquids, confined space entry procedures, and the ship's tag-out program.

3.8.3 Working Condition

Merchant mariners spend extended periods at sea. Most deep-sea mariners are hired for one or more voyages that last for several months; there is no job security after that. The length of time between voyages varies depending on job availability and personal preference.

At sea, a pump man will usually work 8- to 12-hour days, 7 days a week. People in water transportation occupations work in all weather conditions. Although merchant mariners try to avoid severe storms while at sea, working in damp and cold conditions often is inevitable. While it is uncommon nowadays for vessels to suffer disasters such as fire, explosion, or a sinking, workers face the possibility that they may have to abandon their craft on short notice if it collides with other vessels or runs aground.

They also risk injury or death from falling overboard and hazards associated with working with machinery, heavy loads, and dangerous cargo. However, modern safety management procedures, advanced emergency communications, and effective international rescue systems place modern mariners in a much safer position.

Most new vessels are air conditioned, soundproofed from noisy machinery, and equipped with comfortable living quarters. For some mariners, these amenities have helped ease the sometimes difficult circumstances of long periods away from home. Also, modern communications, especially email, link modern mariners to their families. Nevertheless, some mariners dislike the long periods away from home and the confinement aboard ship and consequently leave the occupation.

In the United States, the rate of unionization for these workers is about 36 percent, much higher than the average for all occupations. Consequently, merchant marine officers and seamen, both veterans and beginners, are hired for voyages through union hiring halls or directly by shipping companies. Hiring halls rank the candidates by the length of time the person has been out of work and fill open slots accordingly. Hiring halls typically are found in major seaports.

Pump men employed on Great Lakes ships work 60 days and have 30 days off, but do not work in the winter when the lakes are frozen. Workers on rivers, on canals, and in harbors are more likely to have year-round work. Some work 8-hour or 12-hour shifts and go home every day. Others work steadily for a week or a month and then have an extended period off. When working, they usually are on duty for 6 or 12 hours and off for 6 or 12 hours. Those on smaller vessels are normally assigned to one vessel and have steady employment.

3.9. AB – Able Seaman

An **able seaman** (AB) is a naval rating of the deck department of a merchant ship with more than two years' experience at sea and considered "well acquainted with his duty". An AB may work as a watch stander, a day worker, or a combination of these roles. Once a sufficient amount of sea time is acquired, then the AB can apply to take a series of courses/examinations to become certified as an officer.

Watch stander

At sea an AB watch stander's duties include standwathcing as helmsman and look out. A helmsman is required to maintain a steady course, properly execute all rudder orders and communicate utilizing navigational terns relating to heading and steering. A watch stander may be called ypon stand security-related watches, such as a gangway watch or anchor watch while the ship is not underway.

Day worker

Knowing how to safely work aloft to maintain cargo rigging is a skill required of an AB. An AB day worker performs general maintenance, repair, sanitation and upkeep of material, equipment, and areas in the deck department. This can include maintenance of the ship's metal structures such as chipping, scraping, cleaning, priming, and painting. Areas frequently in need of such maintenance include the hull, decks, superstructure, cargo gear, and smoke stack. Day workers also frequently perform maintenance on lifeboats, rescue boats and life rafts, and emergency and damage control gear. For many vessels, being a day worker is a position granted to senior AB's, since it generally allows more time for rest and relaxation.

General Duties

An AB may be called on to use emergency, lifesaving, damage control, and safety equipment. Able seamen perform all operations connected with the launching of lifesaving equipment. An AB is expected to be able to operate deck machinery, such as the windlass or winches while mooring or unmooring, and to operate cargo gear. Able seamen require advanced training, including lifeboat man certification. The ship's boatswain, if carried, is typically a senior AB. The boatswain is in charge of the able seamen and ordinary seaman that comprise the unlicensed deck crew, and reports directly to the chief mate.

3.10 An ordinary seaman (O/S)

Is a naval rating of the deck department of a ship? The position is an apprenticeship to become an able seaman, and has been for centuries. In modern times, an OS is required to work on a ship for a specific amount of time, gaining what is referred to as “see time”. For centuries, the term ordinary seaman was used to refer to a seaman with between one and two years’ experience at sea, who showed enough seamanship to be so rated by their captain. Historically in some navies and the merchant marine a sailor with less experience was called a landsman.

An O/S is generally not required to stand watch, but must pass examinations on watchstanding skills such as performing lookout duty and being a helmsman. Thus an O/S will often be found on a ship’s bridge after working hours taking a turn at the ship’s wheels or being familiarized with bridge equipment. During the apprenticeship, an O/S performs a variety of duties concerned with operation and upkeep of deck department areas and equipment. These duties vary with the type of ship, the type of voyage, the number of crewmembers, the weather, the supervisor, and any number of other variables. However, in most cases, one can expect an ordinary seaman to clean, to perform maintenance, to work with deck equipment, and to undergo on-the-job-training under the supervision of senior deck department members.

Scale, buff, paint decks and superstructure. A ship's metal structure is under constant attack from the corrosive properties of seawater. Members of a ship's deck department spend a good deal of time identifying and removing rust accumulations, and refinishing affected areas with sealants, primers, and paints to slow the oxidation process.

Sweep and wash deck. Excess water and salt on deck can lead to slipping hazards as well as accelerated rusting of the deck and equipment affixed to it. Ordinary seamen often bear the brunt of the swabbing duties, and many look forward to earning their able seaman's ticket and being done with swabbing.

Splice wire and rope. A proficiency at splicing, knotting, and marlinspike seamanship have identified able seamen for centuries. In the modern merchant fleets, proficiency for this sort of work is a requirement for certification as an able seaman. Thus, during the period of apprenticeship, it is customary for the crew to challenge an ordinary seaman, and call upon the OS to demonstrate these marlinspike seamanship skills at regular intervals, under the guidance of senior members of the deck department.

Break out, rig, overhaul, and stow cargo-handling gear, stationary rigging, and running gear. Depending on the type of ship, it may undergo routine cargo onloads and offloads. On container ships and roll-on roll-off ships, this requires the staging of large amounts of equipment, such as twist-locks, braces, ratchet-straps, tie-down rods, and so forth. These are generally kept in storage during a voyage, so that they won't get thrown by the ship's movement. Thus, the ordinary seaman is often called upon to move this sort of equipment from storage areas to cargo areas.

Secure cargo. Cargo must be secured, or fastened to the ship, when it is brought on board. Depending on the type of ship and the type of cargo, this process may be nearly automatic or a very customized operation. During a voyage, cargo is regularly checked to look for wear and tear, broken or compromised securements, shifting, or any other sort of noncompliance. If irregularities are found, the deck crew must respond by resecuring the cargo. Finally, near the end of the voyage, securements may be exercised or loosened to avoid problems with discharge.

Launch and recover boats. One of the proficiencies that must be demonstrated to pass the examination for able seaman is a proficiency in all aspects of work with lifeboats. International regulations require merchant ships to run regular lifeboat drills, and the ordinary seaman is customarily given a variety of duties during these drills to become familiar and comfortable with launching, commanding, and retrieving a lifeboat.

3.11 Chief Engineer

A **chief engineer** commonly referred to as "**ChEng**" or "**Chief**", is the senior most engine officer of an engine department on a ship, typically a merchant ship, and holds overall leadership and the responsibility of that department. As a person who holds one of the most senior roles on the ship, they must have excellent communication and leadership skills. They will be expected to regularly work alongside other crew members and external consultants, and most importantly, provide guidance to his or her team.

To be a chief engineer, an engineer must attain a chief engineer's license appropriate to the tonnage, power rating, and type of ship that they are employed on. A chief engineer is ultimately responsible for all operations and maintenance that has to do with any and all engineering equipment throughout the entire ship, and supervises all other engineering officer and engine ratings within the department.

The chief engineer is a similar rank as the Captain, but the Captain is the commanding officer on board and in overall command of the vessel. As commanding officer he is responsible for the vessel, cargo and crew. Therefore, all personnel on board answer to him.

Duties of the chief engineer in both general and emergency conditions on the ship are:

- Chief engineer should ensure that all the ship's machinery and equipment are working in an efficient manner in order to support safe navigation of the ship.
- He should carry out all his duties while complying with the rules and regulations laid down by the flag state administration, IMO, and port state authorities.
- Frequent inspections of equipment dealing with ship and personal safety must be carried out by him at regular intervals of time
- All items used for pollution prevention should be frequently checked and tried out for proper operating condition
- Chief engineer should lay down a set of standing orders for each crew member under his command

- The standing orders should be given in accordance with the routine maintenance schedule as laid down by the Planned Maintenance System (PMS), which is prescribed by the manufactures
- He should see that details of every operation and activity should be properly maintained in log and record books, which state the compliance of the system.
- Life-saving and fire preventing equipment should be checked a regular basis for their operating condition. (Operating mechanism and linkages should be inspected and lubricated frequently)
- In order to minimize sources of fire, chief engineer must ensure that proper operation and maintenance of fuel and lubricating oil and purifying equipment is carried out to minimize leakage. In case there are leakages, they should be rectified at the earliest.
- He should also make sure that the amount of waste oil that is collected should be as less as possible. The collected oil should be burnt in an incinerator or given to shore-based collecting facilities.
- Chief engineer should ensure that the maintenance of incinerator is carried out as per the rules and regulations laid down by the management.
- It is imperative of him to check that from the effluent mixture, only clean water is pumped out of the ship only through an oily water separator. (According to few company rules, only the chief engineer should handle the Oily water separator)
- In order to make sure the maintenance and repair procedures are carried out properly, necessary machine spare should be made available in the ships store by filing a proper requisition at the right time.
- It is the duty of the chief engineer to motivate his crew to develop a “safety first” attitude in his work.
- Chief engineer also makes sure that his crew attends all shipboard emergency drills and safety meetings.
- Each and every crew member should know how to tackle every kind of situation on the ship. The chief engineer must provide guidance to his crew during drills so that they know how to get out of an emergency situation safely in the minimum time possible.
- While tackling an emergency situation, the Chief Engineer must follow the company guidelines and procedures for dealing with emergencies.
- At the sight of an emergency, response time matters a lot. Therefore, the chief engineer must be able to guide his crew in minimum time to attend and rectify the task.

- Chief engineer must have the knowledge of equipment such as fixed firefighting installation, the operation of quick closing valve etc. in order to deal with extreme emergency situations.
- He must also have the knowledge of shipboard emergency equipment response machinery panel, along with other important emergency machinery
- During an emergency situation, the chief engineer must maintain proper communication with the master regarding the situation of emergency, as the ship's master is in touch with the local authorities and the shipping office.
- He must be co-operative with the master so that both deck and engine departments function towards bringing the emergency situation under control in the quickest possible time
- Last but not the least, the chief engineer should maintain a proper conduct with his crew members and address their queries and requirements to the best of his abilities.

3.12 Second Engineer (2nd Engineer)

One of the most important positions in the hierarchy level of maritime professionals working on the ship is the position of Second engineer. As the position comes under the management level category, second engineer's job is not only limited to carry out his own duties but also to look after the entire operation of the engine room and other technical aspects of the ship. The 2nd engineer provides utmost assistance to the Chief engineer for running the ship efficiently. Moreover, second engineer is also in-charge of all the operational engineers and the crew of the engine room. He ensures for their personnel safety and routine duties. He also plans the overall maintenance of all the machinery present in the engine room of the ship.

3.12.1 Duties of 2nd Engineer

A brief description of the duties of second engineer is as follows:

Safety

- **Safety of Personnel:** Second engineer is responsible for risk assessment, briefing and safety training of the entire engine crew, especially for the junior engineers and fresh crew.
- **LSA and FFA:** He is responsible for operation and maintenance of life saving appliances and firefighting appliances.
- **Emergency equipment:** All the emergency machinery and equipment under SOLAS are responsibility of second engineer.

- **Rest hours:** The rest hour of all the individual working in the engine room has to be taken care of by the second engineer as per STCW.

Pollution Prevention

- **Pollution Prevention Machineries:** He is the person in-charge of Pollution prevention equipment onboard like OWS, Sewage plant, incinerator etc.
- **Oil transfer:** He is responsible for all oil transfer operations carried out onboard including bunkering.
- **Pollution prevention plan:** He is responsible for implementation of SOPEP and other the equipment involved with the same.
- **Sludge and bilge:** Second engineer has to keep the engine room bilge clean of oil and oily water. All tank parameters are to be recorded for sludge and bilge system.
- **Regulations:** All the rules and regulation related to MARPOL has to be applied and implemented by the second engineer.

Engine Room Management

- **Responsibility:** He is the in-charge for managing the engine room staff and carrying out duties of the engine room.
- **Assistance:** He directly reports to the chief engineer and also becomes the in-charge of the engine room on his absence/behalf.
- **Job distribution:** He distributes and assigns duties to all the engine crew members and acts as supervisor to them.
- **Housekeeping:** He is also the in-charge of engine room housekeeping and engine room garbage management.
- **Spares and inventory:** Second engineer is responsible for storing all the spares properly and keeping and maintaining record of the spares' inventory.
- **Operation and Maintenance of Machinery**
- **Engine room and deck machinery:** The second engineer is responsible for the maintenance of all the engine room and deck machinery.
- **Safe operation:** He is responsible to make sure all the machineries and safety systems are working safely, efficiently and within the provided parameters.
- **PMS and BMS:** Planned maintenance system(PMS) is to be implemented by the second engineer and in case of any breakdown maintenance (BMS), should be immediately taken care of by him.

Documentation

- **Record keeping:** Different records of the engine room have to be maintained and updated regularly. This is the responsibility of the second engineer. A few examples of important records are log book, bell book, Saturday or Monday routine book etc.
- **Spare Inventory:** All the spares for engine room machineries like pumps, auxiliary engine etc. are to be stored and inventory to be maintained and updated regularly.
- **Oil inventory:** The quantity for oil present in the tanks for machinery operation like lube oil, fuel or diesel oil etc. has to be recorded in an oil record book. A track for the next bunker order also needs to be maintained.

- **PMS:** The planned maintenance system paper work like updating the maintenance data etc. is to be completed under the second engineer supervision.
- **Training**
 - He is responsible for familiarizing the crew member with safety features of the ship such as emergency escape, life boat, sopep etc.
 - He should supervise the engine crew for training them to operate pollution prevention machineries like OWS, sewage plant etc.
 - He is responsible to train the crew members for various emergency situations like flooding, fire, pirates attack and abandon ship etc.

3.13. Third Engineer or Second assistant engineer

A **third engineer** or **second assistant engineer** is a rank of engine officer who is part of the engine department on a ship.

The third engineer is usually in charge of boilers, fuel, auxiliary engines, condensate and feed systems, and is the third most senior engine officer on board. Depending on usage, "the Third" or "the Second" is also typically in charge of fueling (a.k.a. bunkering), granted the officer holds a valid Person In Charge (PIC) endorsement for fuel transfer operations.

The exact duties of this position will often depend upon the type of ship and arrangement of the engine department. On ships with steam propulsion plants the Second or Third is in charge of the boilers, combustion control, soot blowers, condensate and feed equipment, feed pumps, fuel, and condensers. On diesel and gas turbine propulsion plants the Second is in charge of auxiliary boilers, auxiliary engines, incinerator, air compressors, fuel, and fuel oil purifiers.

As part of the team servicing the working belly of the ship, Engineering Cadets assist and understudy the ship's Engineering Officers in their duties. Perform all engineering duties aboard ship under supervision of a licensed **engine** officer. ... Assist in all engineering related tasks both operational and maintenance. Complete **Cadet** Training Record Book tasks and projects in a timely manner and in good order. Active and positive participant in all safety meetings.

All the machinery onboard ship is a combination of mechanical and electrical systems. The modern day shipping is more reliable on automations and electronics whose knowledge and maintenance can only be handled by an engineer expert in the electrical field. Marine electrical officer engineers are perfect for such jobs and that's why they hold an important role on ship and in offshore industry.

3.14 Electrical Engineer

Electrical engineer is one of the most vital positions in the technical hierarchy of a ship and engineer is responsible for his assigned work under the chief engineer's instructions.

Some shipping companies do not carry electrical officers on their ship to cut down the manning cost and the electrical duties are carried by someone from the engineer's side, normally third engineer. However, many companies realized that electrical and electronic system requires some extra attention and therefore require an expert to attend them.

As the technology is advancing, more and more automations and electronic circuit is replacing conventional and electrical systems. Hence the international Maritime Organization (IMO) amended STCW 95 on 25th June 2010 known as Manila amendment, to introduce a certified position of Electro-technical officer in place of electrical officer.

The general duties of electrical engineer or Electro-technical officer are:

- He is responsible for maintenance of all the electrical motors on ship i.e. in engine room and on deck.
- He is in charge of maintenance of all switchboard including main switchboard and emergency switchboard.
- He is responsible for maintenance of fire detectors and fire alarm system.
- He has to maintain all the ship's alarm system.
- He is responsible for the electronic system fitted onboard ship.
- He is responsible for the ship's navigational lights and other navigational equipment.
- He is responsible for all the batteries that are connected to machineries onboard. It includes:
 - Emergency batteries for alarm and lights
 - Lifeboat batteries
 - Batteries for emergency generator
 - Other batteries fitted onboard
- He is responsible for maintaining refrigeration unit in the engine room
- He has to take care of air conditioning unit of the vessel.
- Electrical officer is responsible for maintaining refrigerated containers carried on container ship.
- He is responsible for cargo and engine room cranes electrical system.
- He has to carry out routine maintenance for main engine alarms and trips along with the chief engineer.

- During the time of maneuvering, he has to be present in the engine room along with other engineers to tackle any kind of electrical and other emergencies.
- Electrical officer can assist in watch keeping routines at desired time by the chief engineer.
- He has to assist ship's engineer and deck officer in all kind of electrical problems.

Even the post of electrical officer is not a compulsion on a ship, but due to technicalities and complex knowledge requirement of the electrical and electronic system, they are extensively present in the shipping industry.

3.15 Wiper

A **wiper** is the most junior rate in the engine room of a ship. The role of a wiper consists of cleaning the engine spaces and machinery, and assisting the engineers as directed. The position is an apprenticeship to become an oiler. In modern times, a wiper is required to work on a ship for a specific amount of time, gaining what is referred to as "sea time."

As a wiper aboard a United States Merchant Marine vessel or any International Maritime Organization (IMO) certified merchant shipping vessel, the diversity of operational duties is inherent and must be approached as such. Typically, with little experience, a wiper may work under the close supervision of trained and qualified engineers of the engineering department belonging to the vessel. Taking commands and directions from the 1st Assistant Engineer, the Chief Engineers' foremost subordinate, the wiper is in charge of, but not wholly responsible for, maintenance ranging from chipping in the bilges to painting of the overhead in the machinery spaces. As a wiper, additional duties include assisting of licensed engineers, filling in for Qualified Members of the Engine Department (QMED) when necessary, and standing as a member of the watch team but not assigned watches.

Duties while serving day work, typically while in port or underway, involve cleaning and degreasing of equipment, greasing of parts, and oversight of all machinery spaces in terms of cleanliness. The Wiper position is the highest-ranking unlicensed position in the engineering department.^[3] The Wiper position is designated for apprentices to the engineering department where a basic working knowledge of plant layout is learned. Work to be performed by a wiper is typically of low-stakes nature and is meant to create a work-positive environment where sea time may be secured towards licensure. As the typical wiper is aboard a vessel and underway, although they may be found in land-based operations such as railroading as well, they must be fluent in ship operations and have familiarity with safety equipment used. As the United States Merchant Marine is strict in compliance of international organization's precedent in regards to regulations on shipping, having to adhere to the standards set by the International Maritime Organization (IMO), many of the same requirements can be found for vessels that do not serve under the United States Jones Act. In relation to this requirement, a wiper is to be sufficiently trained on how to carry out firefighting operations; this includes the proper donning, assembly, use, and maintenance of all equipment involved should the need arise in order to facilitate the need for all seafarers to be fluent in lifesaving procedures.

These requirements are mandatory and are also adhered to on an international and involuntary basis with the need to renew the very same preliminary physical and firefighting examinations found within CFR 46. The global institution responsible for mandating standards for lifesaving procedures and equipment is commonly known as the International Convention for the Safety of Life At Sea (SOLAS). As a crew member, it is to be noticed that a Wiper may undergo a condition known as burnout syndrome. This is where a seafarer may be overcome by increased anxiety and stress by means of poor leadership, long hours, and high-risk applications. The implications of work-related stress stemming from seafaring operations can be largely alleviated through clear communication of crew and leadership and occasionally moderation through a human resources department. For this reason, it is of medical importance that a wiper finds employment where the safety and wellbeing of workers is held to a high standard. Seafarers and labor unions, necessitated from this occurrence, are closely related in this nature.

3.16 Oilers

Oilers lubricate and clean the various parts to keep the motors functioning properly. The main duty of an oiler is maintaining, cleaning and, at times, operating ship engine parts, including blowers, compressors, motors, gears, ejectors and other equipment. They are responsible for operating the lubricant filtering and purifying equipment and keeping logs of the oiling.

Repairs

It is an oiler's duty to check gauges and dials on the equipment to make sure the equipment is working. If an oiler observes something wrong with the machinery, he determines the cause of the problem and the solution. He is responsible for repairing the equipment.

Nautical Tasks

In addition to equipment duties, oilers often help deck workers and officers with shipping tasks. Oilers assist with loading cargo and maintaining the ship's safety system. An oiler may be required to take on unrelated duties relating to sewage, electrical systems, and water on board the ship

4.0 CREW CHANGING

4.1 Change of Master

The Master must prepare a record of information in view to familiarize his successor with the vessel. This record must include information such as:

- Cargo on board, port of lading, port of discharge
- Cargo condition, stability condition, schedules, dangerous cargo
- Voyage planning
- Ship's characteristics, equipment, maintenance
- Ship's charter-party (if any)
- Ship's certificates
- Ship's stores, provisions, slop chest
- Routine messages to be sent
- Crew evaluation
- Ship's budget and funds etc.

The relieving Master will take over the responsibility that all stocks are correct as accounted. Also, prior to taking over should be familiarized with vessel condition, cargo and safety on board. The relieve must be indicated in the deck logbook.

4.2 Change of Chief Officer

Information such as:

- Maintenance Program
- Cargo, ship's condition and characteristics
- Stability
- Deck crew evaluation
- Administration, stock, budget etc.

Must at least be included in the relieve procedure and report.

4.3 Change of Chief Engineer

Information such as:

- Maintenance Program
- Engine and machinery condition and report
- Administration, stock, budget
- Technical equipment and characteristics
- Engine crew evaluation etc.

Must at least be included in the relieve.

4.4 Change of Officers and Crew

Personnel new to the ship must be familiarized with their scope of work. Muster rolls and safety and lifesaving equipment.

Fire drills and lifeboat drills to be carried out soonest possible after major crew changes.

All crew changes must be indicated in the deck logbook.

5.0 What is IMO?

IMO- the International Maritime Organization.

As a specialized agency of the United Nations, IMO is the global standard-setting authority for the safety, security and environmental performance of international shipping. Its main role is to create a regulatory framework for the shipping industry that is fair and effective, universally adopted and universally implemented. In other words, its role is to create a level playing-field so that ship operators cannot address their financial issues by simply cutting corners and compromising on safety, security and environmental performance. This approach also encourages innovation and efficiency.

Shipping is a truly international industry, and it can only operate effectively if the regulations and standards are themselves agreed, adopted and implemented on an international basis. And IMO is the forum at which this process takes place. International shipping transports more than 80 per cent of global trade to peoples and communities all over the world. Shipping is the most efficient and cost-effective method of international transportation for most goods; it provides a dependable, low-cost means of transporting goods globally, facilitating commerce and helping to create prosperity among nations and peoples. The world relies on a safe, secure and efficient international shipping industry – and this is provided by the regulatory framework developed and maintained by IMO. IMO measures cover all aspects of international shipping – including ship design, construction, equipment, manning, operation and disposal – to ensure that this vital sector for remains safe, environmentally sound, energy efficient and secure. Shipping is an essential component of any programme for future sustainable economic growth. Through IMO, the Organization's Member States, civil society and the shipping industry are already working together to ensure a continued and strengthened contribution towards a green economy and growth in a sustainable manner. The promotion of sustainable shipping and sustainable maritime development is one of the major priorities of IMO in the coming years. As part of the United Nations family, IMO is actively working towards the 2030 Agenda for Sustainable Development and the associated SDGs. Indeed, most of the elements of the 2030 Agenda will only be realized with a sustainable transport sector supporting world trade and facilitating global economy. IMO's Technical Cooperation Committee has formally approved linkages between the Organization's technical assistance work and the SDGs. While the oceans goal, SDG 14, is central to IMO, aspects of the Organization's work can be linked to all individual SDG. Energy

efficiency, new technology and innovation, maritime education and training, maritime security, maritime traffic management and the development of the maritime infrastructure: the development and implementation, through IMO, of global standards covering these and other issues will underpin IMO's commitment to provide the institutional framework necessary for a green and sustainable global maritime transportation system.

5.1 List of IMO Conventions

Key IMO Conventions

- ✓ International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended
- ✓ International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto and by the Protocol of 1997 (MARPOL)
- ✓ International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) as amended, including the 1995 and 2010 Manila Amendments

Other conventions relating to maritime safety and security and ship/port interface

- ✓ Convention on the International Regulations for Preventing Collisions at Sea (COLREG), 1972
- ✓ Convention on Facilitation of International Maritime Traffic (FAL), 1965
- ✓ International Convention on Load Lines (LL), 1966
- ✓ International Convention on Maritime Search and Rescue (SAR), 1979
- ✓ Convention for the Suppression of Unlawful Acts Against the Safety of Maritime Navigation (SUA), 1988, and Protocol for the Suppression of Unlawful Acts Against the Safety of Fixed Platforms located on the Continental Shelf (and the 2005 Protocols)
- ✓ International Convention for Safe Containers (CSC), 1972
- ✓ Convention on the International Maritime Satellite Organization (IMSO C), 1976
- ✓ The Torremolinos International Convention for the Safety of Fishing Vessels (SFV), 1977, superseded by the 1993 Torremolinos Protocol; Cape Town Agreement of 2012 on the Implementation of the Provisions of the 1993 Protocol relating to the Torremolinos International Convention for the Safety of Fishing Vessels
- ✓ International Convention on Standards of Training, Certification and Watchkeeping for Fishing Vessel Personnel (STCW-F), 1995
- ✓ Special Trade Passenger Ships Agreement (STP), 1971 and Protocol on Space Requirements for Special Trade Passenger Ships, 1973

Other conventions relating to prevention of marine pollution

- ✓ International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties (INTERVENTION), 1969
- ✓ Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (LC), 1972 (and the 1996 London Protocol)
- ✓ International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC), 1990
- ✓ Protocol on Preparedness, Response and Co-operation to pollution Incidents by Hazardous and Noxious Substances, 2000 (OPRC-HNS Protocol)
- ✓ International Convention on the Control of Harmful Anti-fouling Systems on Ships (AFS), 2001
- ✓ International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004
- ✓ The Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009

Conventions covering liability and compensation

- ✓ International Convention on Civil Liability for Oil Pollution Damage (CLC), 1969
- ✓ 1992 Protocol to the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage (FUND 1992)
- ✓ Convention relating to Civil Liability in the Field of Maritime Carriage of Nuclear Material (NUCLEAR), 1971
- ✓ Athens Convention relating to the Carriage of Passengers and their Luggage by Sea (PAL), 1974
- ✓ Convention on Limitation of Liability for Maritime Claims (LLMC), 1976

International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea (HNS), 1996 (and its 2010 Protocol)

- ✓ International Convention on Civil Liability for Bunker Oil Pollution Damage, 2001
- ✓ Nairobi International Convention on the Removal of Wrecks, 2007

The 1978 STCW

6.1 What is STSW?

The **1978 STCW Convention** was the first to establish minimum basic requirements on training, certification and watchkeeping for seafarers on an international level. Previously the minimum standards of training, certification and watchkeeping of officers and ratings were established by individual governments, usually without reference to practices in other countries. As a result, minimum standards and procedures varied widely, even though shipping is extremely international by nature.

The **Convention** prescribes minimum standards relating to training, certification and watchkeeping for seafarers which countries are obliged to meet or exceed.

The Convention did not deal with manning levels: IMO provisions in this area are covered by regulation 14 of Chapter V of the **International Convention for the Safety of Life at Sea (SOLAS)**, 1974, whose requirements are backed up by resolution A.890(21) Principles of safe manning, adopted by the IMO Assembly in 1999, which replaced an earlier resolution A.481(XII) adopted in 1981.

One especially important feature of the Convention is that it applies to ships of non-party states when visiting ports of States which are Parties to the Convention. Article X requires Parties to apply the control measures to ships of all flags to the extent necessary to ensure that no more favorable treatment is given to ships entitled to fly the flag of a State which is not a Party than is given to ships entitled to fly the flag of a State that is a Party.

The difficulties which could arise for ships of States which are not Parties to the Convention are one reason why the Convention has received such wide acceptance. By 2018, the STCW Convention had 164 Parties, representing 99.2 per cent of world shipping tonnage.

In addition, the STCW Convention includes chapters to provide details of the exact requirements and standards of competence for each certificate as follows:

- Chapter II - master and deck department)
- Chapter III - engine department
- Chapter IV - radio personnel
- Chapter V - training requirements for personnel on certain types of ships
- Chapter VI - emergency, occupational safety, medical care and survival functions

6.2 General requirements for officers.

Being an officer, you must meet minimum requirements in respect of standards of competence, seagoing service time, medical fitness and age. You should be in possession of a valid certificate of competence according to your rank and functions on-board. This certificate should be endorsed (in the same certificate or in a separate document) by the issuing administration. You should also have all the ancillary certificates required such as radar or ARPA, GMDSS, and those referring to safety duties on-board specific types of ships. Part 2 and part 3 of this section will give you guidance as to what certificates officers require. To know the exact requirements and standards of competence for each certificate you should consult chapters II (master and deck department), III (engine department), IV (radio personnel), V (training requirements for personnel on certain types of ships), VI (emergency, occupational safety, medical care and survival functions) of the STCW Convention. These chapters should be read in conjunction with the respective section of part A of the STCW Code.

Revalidation requirements for officers:

Certificates for masters, officers and radio operators must be endorsed by the issuing administration and re-validated at intervals not exceeding five years. Certificates issued under STCW standards should be upgraded to the 2010-amended STCW standards before January 2017 (see section 4). Other certificates for specialized training are subject to refresher training (see part 2 in this section).

Officers serving on ships registered under a foreign flag: If you intend to serve on ships registered under the flag of a foreign country, then you need an endorsement of recognition issued by the administration of that country. Some administrations may also require an endorsement of recognition for specialized training certificates. In some instances, administrations from other countries will only recognize training which has been completed at specific training establishments in your country of origin. If in doubt, ask the foreign administration if it has any requirements in this respect. Going for the next higher certificate: If you eventually want to opt for the next higher certificate you will need to meet a number of requirements, including approved training and education, minimum age, approved seagoing service and medical fitness. Officers' duties on joining any ship: All officers need to complete a period of ship-specific and security familiarization training before being assigned any

shipboard functions. There is no certificate awarded for this, but a record of the training should be kept in the ship's official logbook. This requirement applies to any member of the crew, including hotel staff holding officer rank in passenger ships.

Basic safety training for officers:

Officers serving on any type of ship who are designated with safety and pollution prevention responsibilities in the operation of the ship need basic safety training. Such training must cover personal survival techniques, basic fire prevention and fire fighting, elementary first aid, and personal and social responsibilities. This requirement applies to practically all officers serving on merchant ships. Cadets assigned with these duties also need to complete basic safety training before going to sea. Basic safety training should be documented as having taken place within five years of the officers being assigned to safety and pollution prevention duties. You need to complete an approved training course or provide evidence that you have achieved the required standards of competence within the previous five years (by participating in drills and exercises, for example, or assessment by a qualified assessor). It is advisable that you do hold some form of documentary evidence to show that you have achieved competence in these functions within the previous five years (this may be in the form of record of drills or letters from a training center). New requirements of the amended 2010 STCW All ships must have a qualified security officer delegated by the company and master of the ship, who is responsible for ensuring that the other crew are familiarized and trained in security matters for that vessel. The revised convention has introduced bridge resource management and engine resource management requirements for senior officers and leadership and management skills within their certificate. Companies should be responsible for providing training in these areas where seafarers do not have appropriate training. Where the company requires carrying an electro-technical officer they should comply with the new competency requirements under A-III/6.

6.3 General requirements for ratings.

Ratings fall under three general categories; those forming part of a watch (deck or engine), those who are not assigned watch-keeping duties, and those undergoing training. As a rating you are required to meet minimum standards of medical fitness, minimum age (if designated with watch-keeping duties), competence (if designated with watch-keeping duties), and seagoing service time (if designated with watchkeeping duties). Ratings who are not assigned watch-keeping duties or those still undergoing training are not required to hold watch-keeping certificates. All other certification requirements for ratings depend on the functions performed on board. Part 2 and part 3 of this section will give you guidance as to what certificates you require, depending on the function you perform and the type of ship you are serving on. If you want to know the exact standards of competence you should meet, consult chapters II (master and deck department), III (engine department), IV (radio personnel), V (training requirements for personnel on certain types of ships), VI (emergency, occupational safety, medical care and survival functions) of the STCW Convention. These chapters should be read in conjunction with the respective section of part A of the STCW Code.

Ratings assigned watch-keeping duties

Ratings forming part of a watch (deck or engine) need to be specifically certified for this function. If you are part of a navigational watch, you need to hold a certificate known as 'rating forming part of a navigational watch' certificate. On the other hand, if you are part of an engineering watch, you will need to hold a certificate known as 'rating forming part of an engineering watch' certificate. To obtain these certificates you need to show that you are competent in the functions set out in the following paragraphs. You can find the complete version of these in the STCW Convention under section A-II/4 for deck personnel and A-III/4 for engine personnel. Seafarers who have the appropriate competencies to become able seafarer deck or able seafarer engine under the new provisions II/5 and III/5 must first have become proficient watchkeeper. However if you served for a period of not less than one year as a rating in the relevant capacity before the convention came into force for the administration issuing your certificate then you may be considered to meet the competence requirements and will be certified

accordingly, without needing to undergo any further training. The above may also apply to integrated ratings under the new provisions of VII/2.4. Ratings forming part of a navigational watch you should meet the competence requirements stated below. These do not apply to ratings on ships of below 500 gross tonnages.

You must be able to:

- Steer the ship and comply with helm orders issued in English (covers the use of magnetic and gyro compasses, helm orders, change over from automatic pilot to hand steering device and vice-versa).
- Keep a proper look-out by sight and hearing (covers the responsibilities of a look-out including reporting the approximate bearing of a sound signal, light or other object in degrees or points).
- Contribute to monitoring and controlling a safe watch (covers shipboard terms and definitions, use of internal communication and alarm systems, have the ability to understand orders and to communicate with the officer of the watch in matters relevant to watch-keeping duties, be familiar with the procedures for the relief, maintenance and hand-over of a watch, the information required to maintain a safe watch and basic environmental protection procedures).
- Operate emergency equipment and apply emergency procedures (covers knowledge of emergency duties and alarm signals, knowledge of pyrotechnic distress signals, satellite EPIRB's and SARTS, avoidance of false distress alerts and action to be taken in the event of accidental activation)

6.3.1 Ratings forming part of engineering watch.

Being a part of an engineering watch you should meet the competence requirements stated below. The requirements are the same as for STCW-95. They do not apply to ratings on ships of below 750kW in propulsion power.

You need to be able to:

- Carry out a watch routine appropriate to the duties of a rating forming part of an engine room watch, and communicate effectively in matters related to watch-keeping duties (covers terms used in machinery spaces and the names of machinery and equipment, engine-room watch-keeping procedures, safe working practices in engine-room operations, basic environmental protection procedures, use of internal communications systems, engine room alarm systems, and ability to distinguish between the various alarms with special reference to fire extinguishing gas alarms).
- Keep a boiler watch and maintain the correct water level and steam pressure (covers safe operation of boilers).
- Operate emergency equipment and apply emergency procedures (covers knowledge of emergency duties, escape routes from machinery spaces, familiarity with the location and the use of firefighting equipment in machinery areas).

Basic safety training for ratings.

Ratings serving on any type of ship that are designated with safety, security and pollution prevention responsibilities in the operation of the ship need basic safety training. This covers personal survival techniques, basic fire prevention and fire fighting, elementary first aid, and personal and social responsibilities. This requirement applies to practically all ratings serving on merchant ships as well as to ratings undergoing training. Basic safety training should be documented as having taken place within five years of a rating's being assigned to safety and pollution prevention duties. You need to complete an approved training course or provide evidence that you have attained the required standards of competence within the previous five years (by participating in drills and exercises, for example, or assessment by a qualified assessor). There is no requirement for seafarers to hold an official certificate of basic training,

but it is advisable that you possess some form of documentary evidence to show that you have attained competence in these functions within the previous five years (record of drills or letters from a training center).

6.4 Certificates and general requirements by rank

General requirements to obtain a certificate of competency as **master**

6.4.1 Masters on ships of 3,000 gross tonnages or more must:

- Previous certificate & seagoing service: meet requirements for certification as an officer in charge of a navigational watch on ships of 500 gross tonnage or more and have at least 36 months approved seagoing service in that capacity; however, this period may be reduced to not less than 24 months if not less than 12 months of such seagoing service has been served as chief mate.
- Education & Training: have completed a period of approved education and training and meet the standard of competence specified in section A-II/2 of the STCW Code for masters on ships of 3,000 gross tonnages or more.

6.4.2 Chief mate

General requirements to obtain a certificate of competency as chief mate

Chief mates on ships of 3,000 gross tonnages or more must:

- Previous certificate & seagoing service: meet requirements for certification as an officer in charge of a navigational watch on ships of 500 gross tonnage or more and have at least 12 months approved seagoing service in that capacity
- Education & training: have completed approved education and training and meet the standard of competence specified in section A-II/2 of the STCW Code for masters and chief mates on ships of 3,000 gross tonnage or more

6.4.3 General requirements to obtain a certificate of competency as officer in charge of a navigational watch.

Officers in charge of a navigational watch on ships of 500 gross tonnages or more must:

- Age: be not less than 18 years of age.
- Seagoing service: have approved seagoing service of not less than one year as part of an approved training programme, including onboard training. This training must meet the requirements of section A-II/1 of the STCW Code and be documented in an approved training record book. Otherwise, the seafarer must have approved seagoing service of not less than 36 months.
- Bridge watch-keeping duties: have performed, during the required seagoing service, bridge watch-keeping duties under the supervision of the master or a qualified officer for a period of not less than six months.
- Radio duties: meet the applicable requirements of the regulations in chapter IV (GMDSS), as appropriate, for performing designated radio duties in accordance with the radio regulations.
- Education and Training: have completed a period of approved education and training and meet the standard of competence specified in section A-II/1 of the STCW Code.

6.4.4 General requirements to obtain a certificate of competency as a rating forming part of a navigational watch

Applies only for service on ships of 500 gross tonnages or more.

The rating must:

- Age: be not less than 16 years of age.
- Seagoing service: have completed approved seagoing service, including not less than six months' training and experience,
- Education & training: have received special training, either pre-sea or onboard ship, including an approved period of seagoing service which shall not be less than two months; and
- Competence: meet the standard of competence specified in section A-II/4

6.4.5 General requirements to obtain a certificate of competency as an able seafarer deck

Applies only for service on ships of 500 gross tonnages or more.

The rating must:

- Age: be not less than 18 years of age.
- Meet the requirements for certification as a rating forming part of a navigational watch.
- Seagoing service: have completed 18 months approved seagoing service in the deck department, or 12 months and completed approved training.
- Education & training: onboard training documented in a training book or approved training ashore with a minimum of 12 months sea service.
- Competence: meet the standard of competence specified in section A-II/5. Note: There are also alternative training options for integrated ratings in A-VII/2, and seafarers should make enquires with their national administrations.

6.4.6 Chief engineer

General requirements to obtain a certificate of competency as a chief engineer

Chief engineer officers on ships powered by main propulsion machinery of 3,000 kW propulsion power or more must:

- Previous certificate & seagoing service: meet the requirements for certification as an officer in charge of an engineering watch and have not less than 36 months approved seagoing service, of which not less than 12 months shall have been served as an engineer officer in a position of responsibility while qualified to serve as second engineer officer.
- Education & training: have completed approved education and training and meet the standard of competence specified in section A-III/2 of the STCW Code

6.4.7 General requirements to obtain a certificate as a Second engineer

Second engineer officers on ships powered by main propulsion machinery of 3,000 kW propulsion power or more must:

- Previous certificate & seagoing service: meet the requirements for certification as an officer in charge of an engineering watch and have not less than 12 months approved seagoing service as assistant engineer officer or engineer officer.
- Education & training: have completed approved education and training and meet the standard of competence specified in section A-III/2 of the STCW Code.

Note: Second engineer officers qualified for service on ships powered by main propulsion machinery of 3,000 kW propulsion power or more, may serve as chief engineer officer on ships powered by main propulsion machinery of less than 3,000 kW propulsion power provided not less than 12 months approved seagoing service shall have been served as an engineer officer in a position of responsibility and the certificate is so endorsed.

6.4.8 General requirements to obtain a certificate of competency as an officer in charge of engineering watch (3rd Engender)

Officers in charge of an engineering watch in a manned engine-room or designated duty engineers in a periodically unmanned engine-room (750 kW propulsion power or more) must:

- Age: be not less than 18 years of age.
- Seagoing service: have completed not less than 12 months of combined workshop skills training and approved seagoing service of which not less than 6 months shall be seagoing service as part of an approved training programme or; not less than 36 months of combined workshop skills training and approved seagoing service of which not less than 30 months shall be seagoing service in the engine department. This must be documented in an approved training record book.
- Have performed, during the required seagoing service, engine-room watch-keeping duties under the supervision of the chief engineer or a qualified engineer officer for a period of not less than six months.
- Education & training: have completed approved education and training and meet the standards of competence specified in section A-III/1 of the STCW Code. Note: The minimum period of training has been reduced from 30 months to 12 months of a combined workshop skills training and an approved seagoing service (six months) as part of an approved training programme. However competence levels have not been reduced and training periods should remain as currently set by administrations.

Note: The minimum period of training has been reduced from 30 months to 12 months of a combined workshop skills training and an approved seagoing service (six months) as part of an approved training programme. However competence levels have not been reduced and training periods should remain as currently set by administrations

6.4.9 General requirements to obtain a certificate of competency as an electro-technical officer

Electro-technical officers serving on a seagoing ship powered by a main propulsion machinery of 750 kW propulsion power or more must be:

- Age: not less than 18 years of age.
- Seagoing service: have completed not less than 12 months of combined workshop skills training and approved seagoing service of which not less than six months shall be seagoing service as part of an approved training programme or; not less than 36 months of combined workshop skills training and approved seagoing service of which not less than 30 months shall be seagoing service in the engine department. This must be documented in an approved training record book.
- Education & training: have completed approved education and training programme meeting the standards of competence specified in section A-III/6 of the STCW Code.

Note: Seafarers may be considered to have met requirements of this regulation if they have served on board a ship for a period of not less than 12 months within the last 60 months preceding the entry into force of this regulation and the competence specified in section A-III/6. Notwithstanding the above requirements, a suitable qualified person may be able to undertake certain functions of section A-III/6.

6.4.10 General requirements to obtain a certificate of competency as a rating forming part of a watch in a manned engine-room or designated to perform duties in a periodically unmanned engine room Applies only for service on ships of 750 kW propulsion power or more.

The rating must:

- Age: be not less than 16 years of age.
- Seagoing service: have completed approved seagoing service including not less than six months training and experience, or
- Education & training: special training, either pre-sea or onboard ship, including an approved period of seagoing service which shall not be less than two months; and d) meet the standard of competence specified in section A-II/4 of the STCW Code.

6.4.11 General requirements to obtain a certificate of competency as an able seafarer engine

Applies only for service on ships of 500 gross tonnages or more. The rating must:

- Age: be not less than 18 years of age.
- Meet the requirements for certification as a rating forming part of an engine watch.
- Seagoing service: have completed 12 months approved seagoing service in the deck department, or six months and completed approved training.
- Education & training: onboard training documented in a training book or approved training ashore with a minimum of 12 months sea service.
- Competence: meet the standard of competence specified in section A-III/5. Note: There are also alternative training options for integrated ratings in A-VII/2 and seafarers should make enquire with their national administrations.

7.0 What is ILO?

International Labor Organization (ILO), specialized agency of the United Nations (UN) dedicated to improving labor conditions and living standards throughout the world. Established in 1919 by the Treaty of Versailles as an affiliated agency of the League of Nations, the ILO became the first affiliated specialized agency of the United Nations in 1946. In recognition of its activities, the ILO was awarded the Nobel Prize for Peace in 1969.

The functions of the ILO include the development and promotion of standards for national legislation to protect and improve working conditions and standards of living. The ILO also provides technical assistance in social policy and administration and in workforce training; fosters cooperative organizations and rural industries; compiles labor statistics and conducts research on the social problems of international competition, unemployment and underemployment, labor and industrial relations, and technological change (including automation); and helps to protect the rights of international migrants and organized labor.

In its first decade the ILO was primarily concerned with legislative and research efforts, with defining and promoting proper minimum standards of labor legislation for adoption by member states, and with arranging for collaboration among workers, employers, government delegates, and ILO professional staff. During the worldwide economic depression of the 1930s the ILO sought ways to combat widespread unemployment. With the postwar breakup of the European colonial empires and the expansion of ILO membership to include poorer and less developed countries, the ILO addressed itself to new issues, including the social problems created by the liberalization of international trade, the problem of child labor, and the relationship between working conditions and the environment.

Among intergovernmental organizations the ILO is unique in that its approximately 175 member states are represented not only by delegates of their governments but also by delegates of those states' employers and workers, especially trade unions. National representatives meet annually at the International Labor Conference. The ILO's executive authority is vested in a 56-member Governing Body, which is elected by the Conference. The International Labor Office in Geneva, Switzerland, composed of the permanent Secretariat and professional staff, handles day-to-day operations under the supervision of an appointed director general. The ILO has international civil servants and technical-assistance experts working in countries throughout the world. Among the ILO's many publications are the *International Labor Review* and the *Year Book of Labor Statistics*.

8.0 What is MLC?

Maritime Labor Convention (MLC), according to International Labor Organization, provides a broad perspective to the seafarer's rights and fortification at work. The maritime regulation will finally enter into force on August 20th, 2013. Nearly 1.2 million seafarers will be affected by the terms and conditions of this human rights act, which will lay down a set of regulations for protection at work, living conditions, employment, health, social security and similar related issues.

On the basis of Maritime Labor Convention (MLC), the Seafarer's Employment Contracts will be implemented and mandated against nullifying the present employment contracts. MLC will be similar to the other statutory certifications such as ISM and ISPS onboard ships and the certificate will have 5 years of validity with interim, initial and intermediate surveys. It is imperative for all seafarers to understand the importance of Maritime Labor Convention (MLC), 2006.

Under MLC, 2006, the ship owners are required to submit a DMLC or Declaration of Maritime Labor Compliance to their respective flag states which form a party to the convention. The flag states will accordingly issue the MLC Certificate to the fleet flying their flag following, surveys, inspections, paperwork and approvals. The certificate would be then required to be posted at a conspicuous position onboard.

The Maritime Labor Convention (MLC), is an International Labor Organization convention, number 186, established in 2006 as the *fourth pillar* of international maritime law and embodies "all up-to-date standards of existing international maritime labor Conventions and Recommendations, as well as the fundamental principles to be found in other international labor Conventions. The other pillars are the SOLAS, STCW and MARPOL. The treaties apply to all ships entering the harbors of parties to the treaty (port states), as well as to all states flying the flag of state party (flag states, as of 2019: over 90 per cent).

The convention entered into force on 20 August 2013, one year after registering 30 ratifications of countries representing over 33 per cent of the world gross tonnage of ships. Already after five ratifications the ratifying countries (Bahamas, Norway, Liberia, Marshall Islands, and Panama) represented over 43 per cent of the gross world tonnage^[3] (which is over 33 per cent; the second requirement for entry into force). As of September 2019, the convention has been ratified by 94^[4] states representing over 94 per cent of global shipping.

Although the Convention has not been ratified worldwide, it has widespread effect because vessels from non-signatory states that attempt to enter ports of signatory states may face arrest and penalties for non-compliance with the MLC.

8.1 Contents of MLC,2006

1. Minimum Requirements for seafarers to work on ships

- Minimum age
- Medical certificate
- Training and certifications
- Recruitment and placement

2. Conditions of Employment

- Seafarer's Employment Agreement
- Wages
- Hours of rest and hours of work
- Entitlement to leave
- Repatriation
- Seafarer compensation for ship's loss or foundering
- Manning levels
- Career and skill development and opportunities for seafarer's employment

3. Accommodation, Recreation, Food and Catering

- Accommodation and recreational facilities
- Food and catering

4. Health Protection, Medical Care, Welfare and Social Security Protection

- Medical care on board and ashore
- Ship owner's liability
- Health and safety protection and accident prevention
- Access to shore based welfare facilities
- Social Security

5. Compliance and Enforcement

- Flag state responsibility
- Authorization of recognized organizations
- Maritime labor certificate and declaration of maritime labor compliance
- Inspection and enforcement
- On board compliance procedures
- Port State Responsibilities
- Marine Casualties
- Labour Supplying responsibilities

9.0 What is SOLAS Convention?

The word SOLAS is an abbreviation and SOLAS full form is “Safety Of Life At Sea”, an international maritime treaty, also known as SOLAS Convention or International Convention for the Safety of Life at Sea (SOLAS), which establishes the least safety measures in the construction, equipment and operation of merchant ships.

IMO SOLAS 74, the last adopted revised convention of 1974, includes a number of regulations under different SOLAS chapters, which deals with safety precautions and safety procedures starting from the construction of the ship to real emergency like – “Abandon Ship”. The convention is updated to meet the safety norms in the modern shipping industry from time to time.

This article explains the contents of SOLAS chapters and regulations providing a summary of SOLAS, i.e. different chapters of SOLAS and the regulations they carry. Marine Insight has provided links of various articles which will help the readers to understand how the regulation of the SOLAS Annexes is implemented on a seagoing vessel and the importance of SOLAS.

The SOLAS 1974 international maritime treaty comprises of 13 chapters and each chapter has its own set of regulations. The Following are the list of SOLAS all 14 chapters and the regulations they contain:

9.1 The International Convention for the Safety of Life at Sea (SOLAS), 1974 describes the requirement for all merchant ship of any flag state to comply with the minimum safety norms laid down in the chapters which are as follows:

- **Chapter I – General Provisions:** Surveys and certification of all the safety items etc. are included.
- **Chapter II-1 – Construction – Subdivision and stability, machinery and electrical installations:** Deals with watertight integrity of the ship, especially for passenger vessel.
- **Chapter II-2 – Fire protection, fire detection and fire extinction:** This chapter elaborates the means and measure for fire protection in accommodation, cargo spaces and engine room for the passenger, cargo and tanker ship.
- **Chapter III – Life-saving appliances and arrangements:** All the life-saving appliances and there use in different situations is described.
- **Chapter IV – Radio communications:** Includes requirements of GMDSS, SART, and EPIRB etc. for cargo and passenger vessel.

- **Chapter V – Safety of navigation:** This chapter deals with all the seagoing vessels of all sizes, from boats to VLCCs, and includes passage planning, navigation, distress signal etc.
- **Chapter VI – Carriage of Cargoes:** This chapter defines storage and securing of different types of cargo and containers, but does not include oil and gas cargo.
- **Chapter VII – Carriage of dangerous goods:** Defines the International Maritime Goods Code for storage and transportation of dangerous goods.
- **Chapter VIII – Nuclear ships:** The code of safety for a nuclear-propelled ship is stated in this chapter.
- **Chapter IX – Management for the Safe Operation of Ships:** The International Safety Management code for ship owner and the operator is described clearly.
- **Chapter X – Safety measures for high-speed craft:** safety code for the high-speed craft is explained.
- **Chapter XI-1 & 2– Special measures to enhance maritime safety:** Special and enhanced survey for safe operation, other operational requirements and ISPS code is briefed in this chapter.
- **Chapter XII – Additional safety measures for bulk carriers:** Includes safety requirement for above 150 meters length bulk carrier.
- **Chapter XIII – Verification of Compliance**
- **Chapter XIV -Safety Measures for Ships Operating in Polar Waters**

10.0 Muster List or Station Bill

Important Features of Muster List on Ship

A ship's crew must be prepared at all times to tackle and fight any kind of emergencies which can arise due to reasons such as rough weather, machinery malfunction, pirate attack, human error etc. Such emergencies can lead to a fire, collision, flooding, grounding, environmental pollution, and loss of life.

The Muster List consists of duties and responsibilities in case of such mishaps, designated and assigned to each person on the ship; in other words, it is a list of the functions each member of a ship crew is required to perform in case of emergency.

Owing to it being a document that specifies the job that every crew member is assigned with in case of an emergency, it must be displayed at every conspicuous location onboard. Some of the important areas where the muster list is posted are- Bridge, Engine room, accommodation alleyways etc. – areas where ship's crew spends the maximum of their time.

Clear instructions are provided for every person on board in the language or languages required by the ship's flag State and also in the English language. The list shall be ready before the ship proceeds to sea. The regulatory requirements for the Muster List are specified in **SOLAS Chapter III, Reg. 8 and 37**. The regulation applies to **all ships**.

10.1 The Important features which are displayed in the muster lists are:

Types of Emergency and different alarms for the same

Main emergencies such as fire, man overboard, abandon ship, oil spill etc. are listed along with dedicated visual and audible alarms. The alarms and indications are visually specified in the list, for further clarity. It includes details of the GA alarm and PA system and action to be taken by crew and passengers when this alarm is sounded. The list specifies how the order to abandon ship will be given, which is usually by the Master's verbal order.

Instruction to follow in case of different types of emergency

Brief instruction is given in case the alarm for a particular emergency is sounded, which includes action to be taken by the crew onboard. Specific duties that are assigned to each person on board are mentioned very clearly in the list. Some of the essential duties specified in the list are:

- Closing of the watertight doors, skylights, portholes and other openings
- Carriage of equipment and readying the survival craft and other life-saving appliances
- Muster of the crew (and passengers, if applicable)
- Heads of emergency teams and fire teams to streamline the action against such emergencies
- The muster list shall also specify the apt substitute in case any person is injured or disabled

General Overview of Life Raft

Common Muster point for all the crew

The common muster point is clearly described if any emergency alarm is sounded. Normally life boat deck area is made as a common muster point. However, the muster point could vary with the type of emergency that is at hand

Crew list of all crew member with assigned life boat

The crew name is displayed along with the assigned life boat for abandon ship emergency. Normally two life boats are assigned in between all the crew member i.e. port side and starboard side life boat. The list displays the officers that are in charge of LSA/FFA maintenance so that all equipment systems are ready for immediate use.

Assigned duties for abandon ship

All the crew listed in the muster list are assigned with duties to perform in an emergency situation like carrying EPIRB and SART, lifeboat and life raft launching etc. **It is imperative to always remember that the ship is abandoned only when the Master's gives a verbal order.**

10.2 Different teams with assigned duties for the individuals of the team for emergencies

Different teams are made to tackle emergencies like fire, flooding etc. these are –

1. **Command Team:** Operated from the bridge. The Master is the overall in charge and the Third Mate assists in relaying the orders of the Master to the respective emergency teams in addition to assisting the Master on Bridge.
2. **Emergency Team 1:** Operates at the point of scenario. Usually headed by the Chief Mate/Second Engineer. The team leaders ensure that the rest are complying
3. **Emergency Team 2:** Standby team and helping hand for emergency team.
4. **Roving Commission:** Team working along with all another team.
5. **Engine room team:** This team stands by in ECR.
6. **Medical Team:** Usually consists of the salon staff (GS + Chief Cook) who are conversant with the first aid to be administered in case a person is injured while carrying out his tasks in an emergency situation

Ship Specification and emergency communication equipment

Ship specifications are displayed along with the communication methods and equipment to be used in case of emergency. Most of these equipment systems have the instructions for usage very clearly given on the body or cover of it.

Special and general instruction by master

A separate section for general and special instructions is provided which is used by the master or the chief engineer of the vessel to keep inform or to instruct the crew of the ship.

The muster list is posted to keep the crew aware of the different emergency situations and duties to be performed if such situations occur in reality. For this, regular training and drill must be conducted by the master of the ship to ensure that all crew members are familiar with life-saving and firefighting appliances.

A **Muster Card** must be placed (by the Third Mate since he's in charge of the LSA and FFA) in every person's cabin that specifies the person's muster station and the exact task that is assigned to them in the case of a specific emergency. The alarm signals are also mentioned so that the person is not confused as to the nature of the emergency. Illustrations and instructions for life jackets may also be included.

It is obvious that protocols laid out will hardly make any sense in the case of a real emergency on board (not drills). However, having a defined set of tasks during an emergency will actually ease the workload on each person and help deal with the situation quicker and better.

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