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ΘΕΜΑ:

ROUTINE OPERATIONS AND VARIOUS INCIDENTS ON BOARD

ΕΠΙΒΛΕΠΩΝ ΚΑΘΗΓΗΤΗΣ: ΠΑΝΑΓΟΠΟΥΛΟΥ ΜΑΡΙΑ

ΤΟΥ ΣΠΟΥΔΑΣΤΗ: ΠΟΜΟΝΗ ΕΛΕΥΘΕΡΙΟΥ

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3				
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INTRODUCTION

In the following project I explicate in great detail combined with the use of examples routine operations and marine incidents on board. It is separated into two chapters, the first one involving routine operations and the second marine incidents on board.

Chapter one “Routine operations” contains the following: anchoring, bunkering, mooring, berthing, loading and discharging. For each of the above I analyze their purpose of the communications used to properly and safely execute the wanted outcome and the differences depending on the type of the vessel.

Chapter two “Marine incidents” begins by analyzing the definition given by the International Maritime Organization. Furthermore it includes the definitions of different incidents with examples that have been reported and took place on board.

ABSTRACT

In this project, I refer to routine operations and marine incidents on board. In the following pages I will present some of the most common routine operations that happens in every vessel, also I will be more specific about type of the vessel and the operations that are taking place on board. Furthermore, I will include some examples of various accidents that have been reported. In closing, I quote some comments pertaining to routine operations and incidents.

CHAPTER 1

ROUTINE OPERATIONS ON BOARD

1.1 ANCHORING

Anchoring is one of the many important operations coming under the responsibility of deck officers. It involves the use of critical shipboard equipment and requires high level of situational awareness. The key responsibility of the deck officer at an anchor station is to use the anchoring machinery and available man power for carrying out the operation safely and efficiently in accordance with the master's instructions.

Communication

Proper and efficient communication between the bridge and the anchor station is the most important aspect of anchoring operations. The deck officer in charge should be thoroughly familiarized with the reporting procedures. While anchoring, it is as significant as to give clear commands to the crew members as it is to receive the same from the Master. It is also essential to update the status of the operation to the bridge, from time to time. Before starting the operation, the officer must be clear on:

1. The anchor to be used (Port or Starboard)

2. How many shackles are to be lowered

3. How the anchor should be lowered (letting go or walking on gear)

Preparation for Anchoring

Once the officer receives the command to prepare for anchoring, he must check on the following points:

1. Presence of crew members wearing proper personal protective equipment (PPE) for assisting the anchor station

2. Confirming the anchor used for the operation (Port or Starboard)

3. The anchor lashings and bow stopper are removed prior commencing the operations

4. When using hydraulic windlass, make sure the pumps are started prior operation

5. Check the working of Windlass and its controls

6. If bow thrusters are likely to be used during anchoring, ensure that the required ventilations are open

7. Anchor day signal (ball) is ready for hoisting after terminating the operation

8. Walkie-talkies radios to be checked

9. Ensure that ship sides are clear of obstructions

Operation

Anchoring operations are of 2 distinct types.

a. 'Letting go' (dropping the anchor)

b. Heaving up (picking up the anchor)

In either case, the deck officer has 3 main responsibilities.

1. Operation of the Windlass

Normally, the operation of windlass is done remotely from the controls. It is best preferred that the windlass operation is carried out by the deck officer, provided the controls are positioned near the ship's side or in such position that he can keep a look at the anchor and its chain while operating the controls. Otherwise, it is preferred to assign the duty to a skilled seaman guided with clear instructions.

2. Visually checking the anchor and its chain

As the officer is in charge of reporting the position and stay of the anchor and its chain, it is recommended to keep a visual check on the same by himself. Any uncertainties or out of ordinary action observed during the anchoring should be reported to the Master in no time.

3. Keeping a track on how many shackles are lowered

Tracking the number of shackles lowered is done by visually observing the 'kender' shackle of the chain. Kender shackle is bigger in size and is usually marked in different color patterns or numbers for easy sighting.

Reporting

Reporting is another vital duty of the deck officer in charge of the anchoring operations.

The duty officer acts as the eye of the Master in anchoring; hence every single status of the operation should be updated to the Master. The most significant factors to be reported are:

1. Anchor position

While anchoring operations are underway, the anchor-chain position is a matter of high concern. The positions are reported normally in

a. Clock format – Considering the bulb as 12'o clock, the position to be reported with reference from the bulb. The positions on starboard side will be 1'o clock; 2'o clock etc. and port side will start from 11′ o clock

b. Cardinal Points – Reporting using the points system with every point 11.25 degrees. Example – 2 points on starboard bow.

2. Chain Stay

Along with the Position, the stay of the chain is also to be reported. Stay of the chain is the tendency of its movement. While reporting the following terms are to be used for the respective observations.

a. Short stay – when the chain is leading in a short range from the ship's side.

b. Medium stay- When the chain is leading in a medium range from the ship's side.

c. Long stay- When the chain is leading in a longer range from the ship's side extending from the hawse pipe.

d. Up and Down – When the chain is vertically leading parallel to the ship's side. It will not extend and will be leading vertically downwards from the hawse pipe to the seabed.

1.2 BUNKERING

Bunkering from the shore can be carried out during cargo operations so long as ship-side scuppers can be closed quickly. Depending on the size of the ship and speed at which it is designed to cruise, the capacity & number of bunker tanks are decided. Typical capacities of bunker tank onboard ships are varying from 150 cubic meters to as big as 3500 cubic meters. The chief engineer of the ship is the official in charge of the bunkering operations and the exact amount of oil to be bunker in each time is decided prior to bunkering. Bunkering on ship can be of fuel oil, sludge, diesel oil, cargo etc. Bunkering of fuel or diesel oil requires utmost care and alertness to prevent any kind of fire accident or oil spill.

Before Bunkering

1. The chief engineer should calculate and check which bunker/fuel oil tanks are to be filled after he receives confirmation from the shore office about the amount of fuel to be received.

2. It might be required to empty some tanks and transfer the oil from one tank to other. This is required so as to prevent mixing of two oils and prevent incompatibility between the previous oil and the new oil.

3. A meeting should be held between the members that will take part in the bunkering process and they should be explained about the following:

a. Which tanks are to be filled.

b. Sequence order of tanks to be filled.

c. How much bunker is to be taken.

e. Emergency procedure in case oil spill occurs.

f. Responsibilities of each officer are explained.

4. Sounding is taken before bunkering and record is made.

5. A checklist is to be filled so that nothing is missed on.

6. All deck scuppers and save all trays are plugged.

7. Overflow tank is checked to be empty.

8. Adequate lighting at bunker and sounding position is to be provided.

9. No smoking notice should be positioned.

10. On board communication between the people involved in bunkering is made.

11. Red flag/light is presented on masthead.

12. Opposite side bunker manifold valves are closed and blanked properly.

13. Vessel draught and trim is recorded before bunkering.

14. All equipment in SOPEP (shipboard oil pollution emergency plan) locker is checked to be in place.

15. When barge is secured to the ship side, the persons involved on barge are also explained about the bunker plan.

16. Barge paperwork is checked for the oil's grade and the density if they are as per the specification.

17. The pumping rate of bunker is agreed with the barge.

18. The hose is then connected to the manifold.

19. All the valves required are open and checked.

20. Proper communication between the barge and the ship is to be established.

21. Sign and signals are to be followed as discussed in case of communication during emergency.

22. After this, the manifold valve is open for bunkering.

During Bunkering

1. During start of the bunker the pumping rate is kept low, this is done so as to check that the oil is coming to the tank to which the valve is opened.

2. After confirming the oil is coming to the proper tank the pumping rate is increased as agreed before.

3. Generally only one tank filling is preferred because gauging of more than one tank at a time increases the chances of overflow.

4. The max allowable to which tank is filled is 90 % and when the tank level reaches about to maximum level the barge is told to pump at low pumping rate so as to top up the tank, and then the valve of other tank is opened.

5. During bunkering, sounding is taken regularly and the frequency of sounding is more when the tank is near to full. Many vessels have tank gauges which show tank level in control room but this is only to be relied if the system is working properly.

6. The temperature of bunker is also to be checked; generally the barge or supplier will provide the bunker temperature. Temperature above this may lead to shortfall in bunker.

7. A continuous sample is taken during bunkering with the help of sampling cock at the manifold.

After Bunkering

1. Draught and trim of the ship is checked.

2. Take sounding of all the tanks bunkered.

3. The volume bunkered should be corrected for trim, heel and temperature correction.

4. In general for each degree of increase in temperature the density should be reduced by 0.64 kg/m3.

5. Four samples are taken during bunkering. One is kept onboard, one for barge, one for analysis, one for port state or IMO. One sample is given to barge.

6. The chief engineer will sign the bunker receipt and the amount of bunker received.

7. If there is any shortfall of bunker received the chief engineer can issue a note of protest against the barge/supplier.

8. After everything is settled the hose connection is removed.

9. The sample is sent for laboratory analysis.

10. The new bunker should not be used until the report from the lab.

1.3 BERTHING AND MOORING

Berthing

Port and terminal authorities should establish berthing and unberthing criteria for safe operations, including limiting wind, wave, current and tide conditions. Requirements for the number and size of tugs must also be set.

Berthing with tugs

Mooring

Mooring line configurations should be agreed as suitable. The initial mooring of the ship to the terminal and the subsequent tending of moorings is most important if the ship is to be safely held alongside and damage to transfer facilities and jetty prevented.

1.4 LOADING/DISCHARGING

1.4.1 BULK CARRIER

A bulk carrier, bulk freighter, or bulker is a merchant ship specially designed to transport unpackaged bulk cargo, such as grains, coal, ore, and cement in its cargo holds.

Loading and unloading a bulker is time-consuming and dangerous. The process is planned by the ship's chief mate under the direct and continued supervision of ship's captain. International regulations require that the captain and terminal master agree on a detailed plan before operations begin. Deck officers and stevedores oversee the operations. The loading method used depends on both the cargo and the equipment available on the ship and on the dock. Double-articulation cranes, which can load at a rate of 1,000 tons per hour, represent a widely used method, and the use of shore-based gantry cranes, reaching 2,000 tons per hour, is growing. A crane's discharge rate is limited by the bucket's capacity (from 6 to 40 tons) and by the speed, at which the crane can take a load, deposits it at the terminal, and to return to take the next. For modern gantry cranes, the total time of the grab-deposit-return cycle is about 50 seconds. Once the cargo is discharged, the crew begins to clean the holds. This is particularly important if the next cargo is of a different type. The immense size of cargo holds and the tendency of cargoes to be physically irritating add to the difficulty of cleaning the holds. When the holds are clean, the process of loading begins. It is crucial to keep the cargo level during loading in order to maintain stability. As the hold is filled, machines such as excavators and

bulldozers are often used to keep the cargo in check. Leveling is particularly important when the hold is only partly full, since cargo is more like
adding longitudinal divisions and securing woo
called tomming is used, which involves digging
and filling it with bagged cargo or weights. As
established between ship and shore as soon as p
allow the terminal to update the ship on its requ
Additionally, port requirements, berthing arrang
advised. Similarly, the shipmaster may inform t
pressures, stores and bunker requirements and p
grain, all ships are usually subject to a survey b

surveyor will require the vessels particulars and details of at least the last three cargoes carried. He will then inspect the holds for cleanliness and infestation, or the presence of any material which could lead to infestation. When the surveyor is satisfied with the condition of the hold, he will issue the ship with a certificate stating which holds are fit to load grain.

1.4.2 OIL TANKER

An oil tanker, also known as a petroleum tanker, is a merchant ship designed for the bulk transport of oil.

Oil tanker

There are two basic types of oil tankers: the crude tanker and the product tanker. Crude tankers move large quantities of unrefined crude oil from its point of extraction to refineries. Product tankers, generally much smaller, are designed to move refined products from refineries to points near consuming markets.

Operations aboard oil tankers are governed by an established body of best practices and a large body of international law. Cargo can be moved on or off of an oil tanker in several ways. One method is for the ship to moor alongside a pier, connect with cargo hoses or marine loading arms. Another method involves mooring to offshore buoys, such as a single point mooring, and making a cargo connection via underwater cargo hoses. A third method is by ship-to-ship transfer, also known as lightering. In this method, two ships come alongside in open sea and oil is transferred manifold to manifold via flexible hoses. Lightering is sometimes used where a loaded tanker is too large to enter a specific port.

Pre-transfer preparation

Prior to any transfer of cargo, the chief officer must develop a transfer plan detailing specifics of the operation such as how much cargo will be moved, which tanks will be cleaned, and how the ship's ballasting will change. The next step before a transfer is the pretransfer conference. The pretransfer conference covers issues such as what products will be moved, the order of movement, names and titles of key people, particulars of shipboard and shore equipment, critical states of the transfer, regulations in effect, emergency and spill-containment procedures, watch and shift arrangements, and shutdown procedures.

After the conference is complete, the person in charge on the ship and the person in charge of the shore installation go over a final inspection checklist. In the United States, the checklist is called a Declaration of Inspection or DOI. Outside the U.S., the document is called the "Ship/Shore Safety Checklist." Items on the checklist include proper signals and signs are displayed, secure mooring of the vessel, choice of language for communication, securing of all connections, that emergency equipment is in place, and that no repair work is taking place.

Oil tanker preparation for loading/discharging

Loading an oil tanker consists primarily of pumping cargo into the ship's tanks. As oil enters the tank, the vapors inside the tank must be somehow expelled. Depending on local regulations, the vapors can be expelled into the atmosphere or discharged back to the pumping station by way of a vapor recovery line. It is also common for the ship to move water ballast during the loading of cargo to maintain proper trim.

Loading starts slowly at a low pressure to ensure that equipment is working correctly and that connections are secure. Then a steady pressure is achieved and held until the "topping-off" phase when the tanks are nearly full. Topping off is a very dangerous time in handling oil, and the procedure is handled particularly carefully. Tank-gauging equipment is used to tell the person in charge how much space is left in the tank, and all tankers have at least two independent methods for tank-gauging. As the tanker becomes full, crew members open and close valves to direct the flow of product and maintain close communication with the pumping facility to decrease and finally stop the flow of liquid.

The process of moving oil off of a tanker is similar to loading, but has some key differences. The first step in the operation is following the same pretransfer procedures as used in loading. When the transfer begins, it is the ship's cargo pumps that are used to move the product ashore. As in loading, the transfer starts at low pressure to ensure that equipment is working correctly and that connections are secure. Then a steady pressure is achieved and held during the operation. While pumping, tank levels are carefully watched and key locations, such as the connection at the cargo manifold and the ship's pump room are constantly monitored. Under the direction of the person in charge, crew members open and close valves to direct the flow of product and maintain close communication with the receiving facility to decrease and finally stop the flow of liquid.

Tanks must be cleaned from time to time for various reasons. One reason is to change the type of product carried inside a tank. Also, when tanks are to be inspected or maintenance must be performed within a tank, it must be not only cleaned, but made gas-free.

On most crude-oil tankers, a special crude oil washing (COW) system is part of the cleaning process. The COW system circulates part of the cargo through the fixed tank-cleaning system to remove wax and asphaltic deposits. Tanks that carry less viscous cargoes are washed with water. Fixed and portable automated tank cleaning machines, which clean tanks with high-pressure water jets, are widely used. Some systems use rotating high-pressure water jets to spray hot water on all the internal surfaces of the tank. As the spraying takes place, the liquid is pumped out of the tank.

After a tank is cleaned, provided that it is going to be prepared for entry, it will be purged. Purging is accomplished by pumping inert gas into the tank until hydrocarbons have been sufficiently expelled. Next the tank is gas freed which is usually accomplished by blowing fresh air into the space with portable air powered or water powered air blowers. "Gas freeing" brings the oxygen content of the tank up to 20.8% O2. The inert gas buffer between fuel and oxygen atmospheres ensures they are never capable of ignition. Specially trained personnel monitor the tank's atmosphere, often using hand-held gas indicators which measure the percentage of hydrocarbons present. After a tank is gas-free, it may be further hand-cleaned in a manual process known as mucking. Mucking requires protocols for entry into confined spaces, protective clothing, designated safety observers, and possibly the use of airline respirators.

As a ship approaches a port, direct contact should be established between ship and shore as soon as possible. Modern communications will readily allow the terminal to update the ship on its requirements for the envisaged transfer operation. Additionally, port requirements, berthing arrangements and the facilities available can also be advised. Similarly, the shipmaster may inform the terminal of the cargo arrival temperatures and pressures, stores and bunker requirements and personnel joining or leaving. After all ballast has been discharged other than any permanent ballast which may be discharged simultaneously with the loading of the cargo, the ship’s cargo valves and pipelines should be correctly set for the reception of cargo and the relevant tank valves opened. Any residual ballast water should be pumped or drained from the

pipeline system either overboard in the case of clean ballast or into a suitable slop tank but always in compliance with the local oil pollution regulations. Before loading, it is customary for a joint inspection of the cargo tanks to be made by shore representatives and ship's officers to confirm that the tanks are properly drained of water and in a suitable condition to load the designated cargo. In general, the completion of such an inspection does not relieve the owner of his responsibility to ensure the correct condition of the cargo tanks. In large tankers and where tanks are inerted, such inspections are difficult and it may be necessary to rely on the ship's gauging equipment rather than any visual inspection. Preparations for the loading of multigrade cargoes are dealt with under the section covering cargo contamination claims. The measurement of any OBQ should be carefully undertaken preferably jointly with the shore representatives. The depth of any residues should be measured at as many locations as possible and at least at the forward and after ends of the tanks. Tank cleaning hatches should be utilized as appropriate.

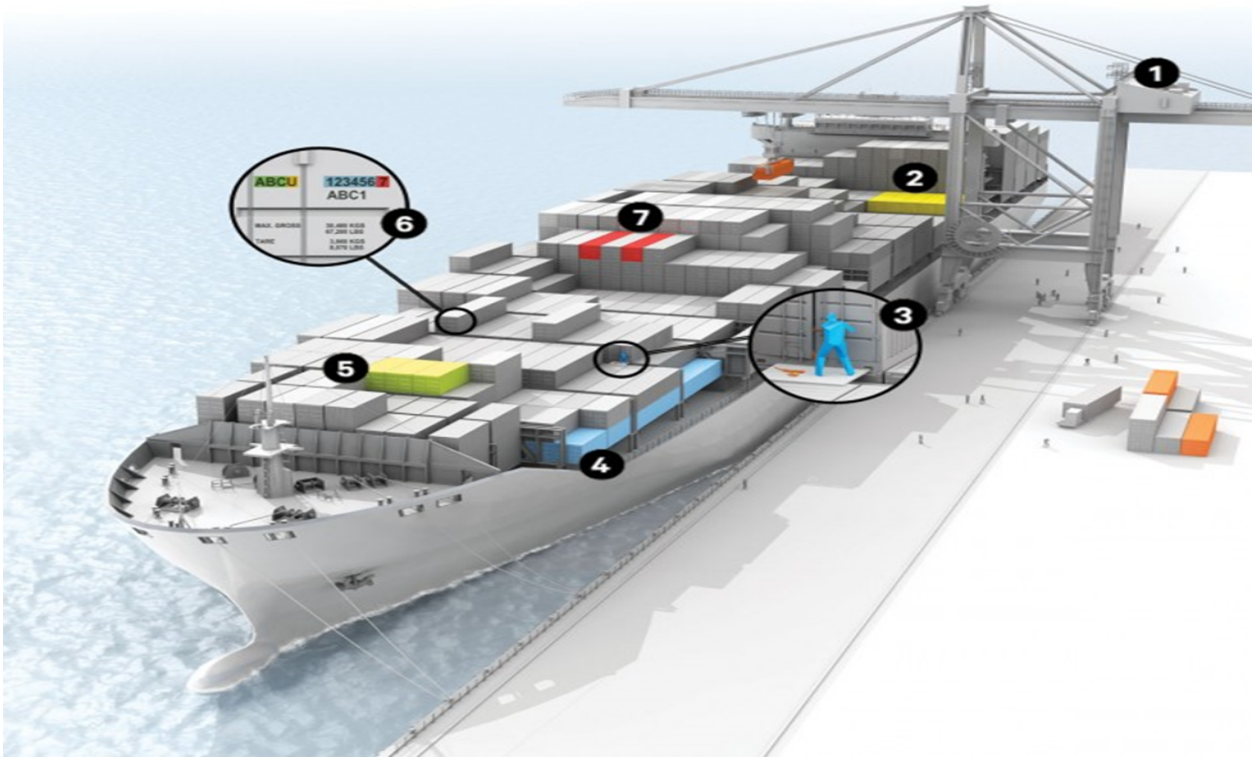
Discharging

On completion of the arrival formalities, the need to communicate with representatives of the discharging facility is no less important than at the loading port. Full liaison should include the exchange of all relevant information about the cargo, including the maximum discharge rates, the discharge plan, safety procedures, shutdown procedures scheduled shore stops and any local regulations. If the ship is fitted with COW it must be clear whether COW is to be carried out, particularly bearing in mind any Marpol requirements.

1.4.3 CONTAINER

Container ships are cargo ships that carry all of their load in truck-size intermodal containers, in a technique called containerization. Container ships have time charter party, which that means loading is a racing against the clock. Here time is definitely money. As a ship approaches a port, direct contact should be established between ship and shore as soon as possible. Modern communications will readily allow the terminal to update the ship on its requirements for the envisaged transfer operation. Additionally, port requirements, berthing arrangements and the facilities available can also be advised. Similarly, the shipmaster may inform the terminal of the

cargo arrival temperatures and pressures, stores and bunker requirements and personnel joining or leaving.



1. Minimize the number of crane moves. Algorithms and computer systems help plan the most efficient and practical storage schemes so ships can get in and out of port fast.
2. Cold boxes need juice. Refrigerated containers—or "reefers"—must be placed near a power source.
3. Guard your vessel. Containers are sealed after inspection, but thieves can use simple tools to get around the seals and pop open the doors.
4. Heaviest boxes go down low. This prevents the stack from collapsing. And they're distributed as evenly as possible to keep the ship balanced.
5. Place flammable stuff away from the edges. If a ship will be traveling through, say, the Indian Ocean, containers of combustible material could be ignited by rocket-propelled grenades from attacking pirates.
6. Every box has an ID number. It shows the owner (green) and category (yellow) of the container, followed by a serial number (blue) and check digit (red). Once they're loaded, a separate system locates each container by bay, row, and tier.
7. Keep certain chemicals apart. Acetylene must be separated by at least one container space or bulkhead from chlorine; barium cyanide must be isolated from acids.
8. **1.4.4 LPG/LNG**

As a ship approaches a port, direct contact should be established between ship and shore as soon as possible. Modern communications will readily allow the terminal to update the ship on its requirements for the envisaged transfer operation. Additionally, port requirements, berthing arrangements and the facilities available can also be advised. Similarly, the shipmaster may inform the terminal of the cargo arrival temperatures and pressures, stores and bunker requirements and personnel joining or leaving. For the planning of ship cargo operations, the shipmaster should be advised by the terminal of all port and terminal requirements relevant to gas carriers. Before the start of any cargo transfer operation, the intended cargo handling procedures must be thoroughly discussed at a meeting held between the responsible personnel from the ship and the terminal. The purpose of the meeting is primarily to draw up a suitable cargo plan and to check on safety issues. Furthermore, the meeting has the benefit of making both sides familiar with the essential characteristics of ship and shore cargo handling systems. At the meeting, the envisaged operational and safety procedures and requirements should be covered. Finally, any limitations to be observed during the transfer should be noted in writing. Written agreements should include a cargo handling plan (including transfer rates), communication procedures, emergency signals, emergency shut-down procedure and the tank venting system to be used. The content of the meeting will depend on a wide variety of circumstances but the following broad outline forms the normal basis for such meetings.

(i) The names and roles of terminal and ship personnel who will be responsible for cargo transfer operations should be noted.

(ii) The terminal representative should check that pre-arrival instructions to the ship on cargo, cargo disposition and cargo arrival temperature have been carried out. They also check that all necessary ship equipment inspections and tests have been performed.

(iii) Similarly, the ship's officers should satisfy themselves that the relevant terminal equipment is satisfactory and that appropriate inspection checks have been carried out.

(iv) The terminal representatives and, where necessary, customs and independent surveyors should be informed of the cargo tank data, such as:

- Temperatures
- Liquid heel or arrival dip

- Pressures
- Composition of tank vapour, and cargo tank quantities
- Total quantity of cargo on board

The ship and terminal should then discuss and agree in writing the quantity and types of cargo to be loaded or discharged and in what order. The anticipated transfer rates and, for discharge, the receiving tank allocations should also be agreed.

LPG during loading/discharging

The cargo transfer operation should be planned and confirmed in writing in order to assure full mutual understanding. The items to be addressed should include:

- The order of loading or discharging
- The total quantities of cargo to be transferred
- The sequence of discharging and receiving tanks
- The intended transfer rates
- The transfer temperatures and pressures to be expected, and
- The use of vapour return line

Simultaneous cargo and ballast handling, for stress and ship stability purposes, should also be noted on the cargo plan.

(v) To reconfirm earlier pre-charter advice, the previous three cargoes carried by the ship and the relevant dates should be noted in order to identify and assess any possible cargo contamination problems, particularly after ammonia.

(vi) The appropriate Cargo Information Data Sheets should be provided and should be posted in prominent places on board the ship and within the terminal. Similar detail for cargo inhibitors should be provided by the terminal.

(vii) A review of port and jetty regulations should be made with particular attention being paid to berth operating limits, fire-fighting capabilities and other emergency procedures. Similarly, ship regulations and emergency procedures should be communicated to terminal personnel. Particular importance should be paid to emergency shut-down valve closure times and to the agreed emergency shut-down procedures. Equipment and procedures for normal and emergency communications between ship and terminal should be defined and understood. Where portable radios are provided, adequate spare battery capacity should be made available. A common language should be established.

(viii) Any further information or procedures relevant to the operation should be discussed.

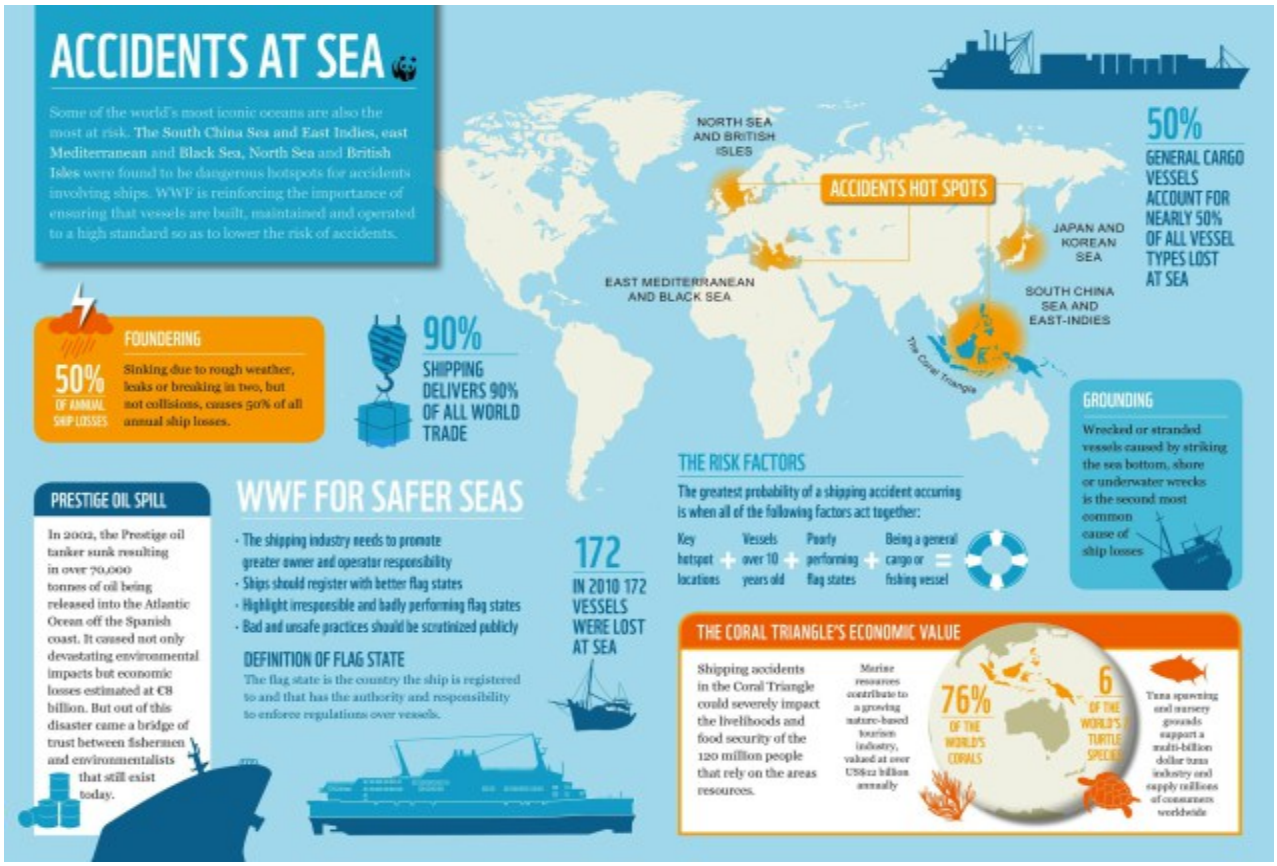
CHAPTER 2

MARINE INCIDENTS ON BOARD

For the purpose of reporting information to the International Maritime Organization, ship casualties are classified as “very serious casualties”, “serious casualties”, “less serious casualties” and “marine incidents”.

“less serious casualties”, according to the definition given by the IMO, are casualties to ship which do not qualify as very serious casualties or serious casualties and for the purpose of recording useful information also include marine incidents which themselves include "hazardous incidents" and "near misses.

Marine incident means an event, or sequence of events, other than a marine casualty, which has occurred directly in connection with the operations of a ship that endangered, or, if not corrected, would endanger the safety of the ship, its occupants or any other person or the environment. However, a marine incident does not include a deliberate act or omission, with the intention to cause harm to the safety of a ship, an individual or the environment.



World's Most Dangerous Ship Accident Hotspots

2.1 GROUNDING

Ship grounding is the impact of a ship on seabed or waterway side. It may be intentional, as in beaching to land crew or cargo, and careening, for maintenance or repair, or unintentional, as in a marine accident.

Vessel's grounding

When unintentional, grounding may result simply in stranding, with or without damage to the submerged part of the ship's hull. Breach of the hull may lead to significant flooding, which in the absence of containment in watertight bulkheads may substantially compromise the ship's structural integrity, stability, and safety. Among the causes of unintentional grounding are:

i. Current
ii. Darkness
iii. Tide
iv. Visibility
v. Waves
vi. Wind
vii. Depth of waterway
viii. Geometry of waterway
ix. Age of vessel

x. Size of vessel
xi. Type of vessel
xii. Speed
xiii. Human and organizational factors

However, the effects of most of the causal factors have been considered anecdotal, without evidential support.

Example: Grounding of a chemical tanker

A chemical tanker was on passage with a small scaled paper chart in use. The second officer saw a target on the radar display, but deselected it from the ARPA before handing over the duty to the first officer. The first officer was not concerned in any way by the radar display or by the position of the ship on the ECDIS or on the paper chart. The ship then grounded.

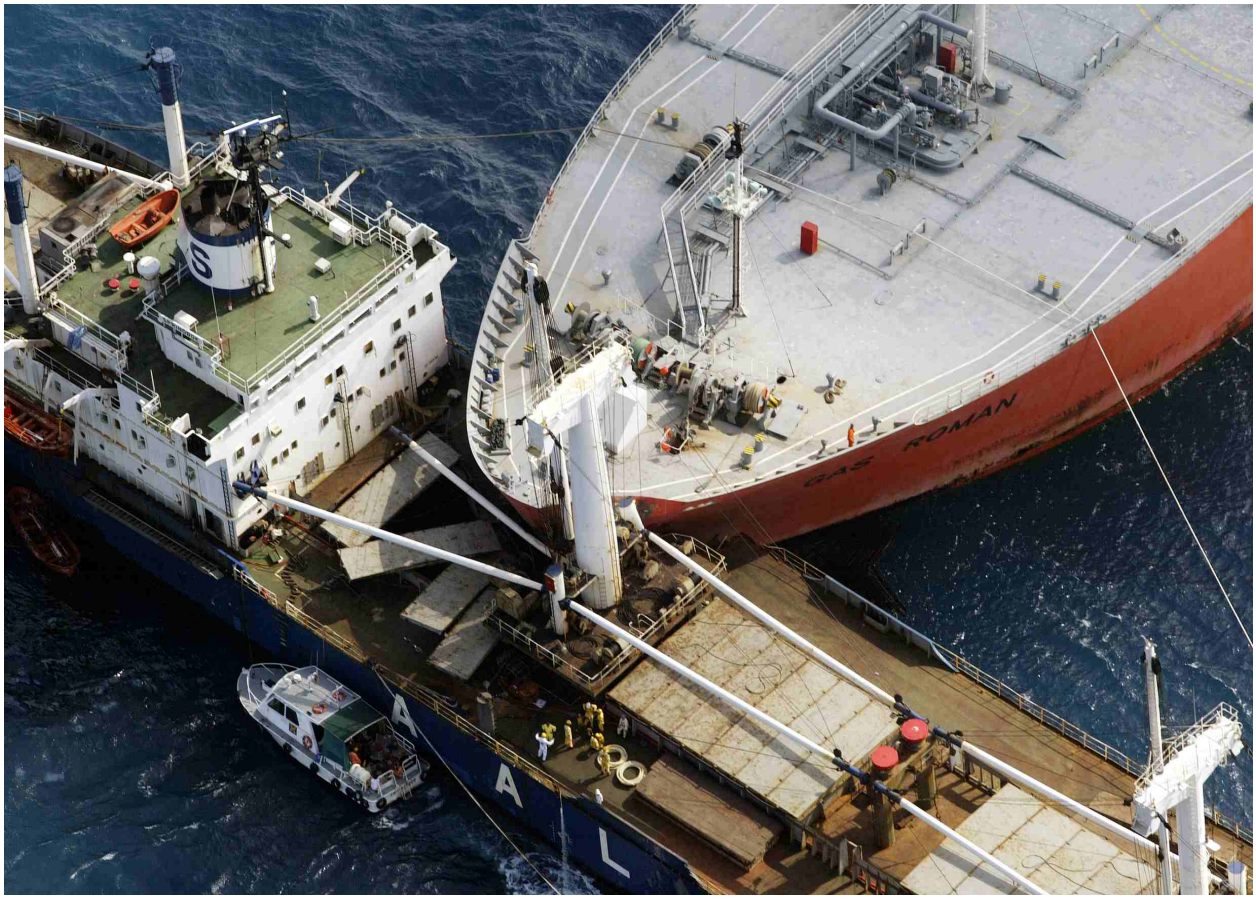
2.2 FLOODING

Ship flooding is the result of incoming waters in compartments on board due to crack of the hull or by human error.

Example: At 0654 on 9 March 2014, the master of Sea Breeze, a Barbados registered general cargo ship, contacted Falmouth Coast guard to report that the ship's engine room was flooding. A ballast pump in the vessel's engine room was being maintained when water began to enter the space. The crew was unable to stem the flow and the engine room was evacuated. The crew did not deal effectively with the emergency as they had not been trained. Salvors were able to bring the flooding under control and the vessel was initially anchored in St Austell bay at 2100 on 10 March before being moved to a berth in Fowey. The MAIB investigation identified a very poor standard of engineering being carried out on a ship in materially poor condition.

2.3 COLLISION

Ship collision is the structural impact between two ships or one ship and a floating or still objects such as an iceberg.



Example: On July 18, 2014, about 0355 central daylight time, the towing vessel Riley Elizabeth was pushing 30 barges on the Mississippi River at Kempe Bend, near Waterproof, Louisiana, when the vessel and two of its barges collided with a US Army Corps of Engineers (Corps of Engineers) barge plant conducting a revetment project. No one was injured in the accident; however, the collision resulted in an estimated $100,000 in damage to the Riley Elizabeth and two of its barges and $200,000 in damage to the barge plant.

2.4 MACHINE FAILURE

Event in which any part of machine does not perform according to its operational specifications. Failures are classified into several categories: dependent failure, non-critical failure, random failure, etc.

Example: Port of Ayr was on passage to new fishing grounds when a loud bang was heard coming from the starboard side of the hull. This was immediately followed by a series of heavy thumps. The gearbox was put into neutral as the chief engineer stopped the engine believing that the vessel had hit an underwater object which may have passed through the propeller. Subsequent checks found that the propeller shaft to be seized. A small hole was also found in the hull in the engine room. External fathering stemmed the water ingress while the hole was shored up, which significantly reduced the flow of water, enabling the bilge pumps to cope easily.

2.5 NEAR MISSES

A near miss is an unplanned event that did not result in injury, illness, or damage – but had the potential to do so. Only a fortunate break in the chain of events prevented an injury, fatality or damage; in other words, a miss that was nonetheless very near.

Example: A ship ran aground when it was being navigated in pilotage waters with its autopilot in “automatic track keeping mode”. The ship was equipped with a sophisticated integrated bridge system which allowed the auto-pilot to make course alterations at programmed way-points. The system failed to initiate a course change, and when the ship was very close to running aground, the master engaged manual steering and turned the ship sharply to avert the grounding.

CONCLUSION

In a nutshell, the rapid technology development makes routine operations even more automatic and safer for the human life and for the environment. This should not be taken for granted because most accidents happen by human error. Incidents should be reported and measures should be taken to decrease any of them in the future

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