EMERGENCY PROCEDURES AND SAR

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Politeknik Ilmu Pelayaran Semarang

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PREFACE

Assalamu'alaikum warahmatullahi wabarakatuh.

Alhamdulillahirabbilalamin. All praise to Allah S.W.T., who has helped us to complete the textbook with ease. Without His help, the author might not be able to complete it properly. Blessing and salutation be on our beloved Prophet Muhammad S.A.W. In addition, we also thank all PIP Semarang lecturers who have provided us with information and input.

We are expected¬ that the textbook on emergency Procedures and SAR can be useful in increasing our knowledge and concept of how we sail with safety to the destination and how we take action when we experience an emergency. We realize that there is some lack and far from perfect. Therefore, we hope there will be criticism and suggestions for improving the textbook that can be made in the future; nothing is perfect without constructive criticism.

We expect that this simple textbook is easy to be understood for anyone who reads it. We hope that this book may be useful for me and anyone who reads it. We apologize if there some words that offends, and we ask for constructive criticism and suggestion from you to improve in the future.

Wassalamu'alaikum warahmatullahi wabarakatuh.

Semarang, June 2018

Author Team

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CHAPTER I.
EMERGENCY PROCEDURES

Specific Instructional Objectives: This chapter will help you to understand the definition of emergency procedures.

This chapter discusses the definition and types of procedures for handling emergencies and situations.

1.1. Introduction

An accident may occur on board while shipping, anchoring, or loading and unloading cargo at the port; even the effort has been made to avoid it.

The management needs to pay attention to the provision stipulated in the Health and Safety Work Act 1974 to protect seafarers and prevent risks while conducting activities on board, especially regarding occupational health and safety during normal situations and emergencies.

An emergency usually occurs either because the process is not working normally as procedures or because of natural disturbance. So besides knowing the specific tasks, they need to know overall procedures to handle the emergency so that they can take over the duties of the lost or injured person.

MARPOL requires every ship above 500GT to have ship oil pollution emergency plan (SOPEP), and the plan needs to be done periodically. The regulation in SOLAS mentioned tasks relating to the passenger that must be assigned as crew. Another task is needed according to condition and ship design.

1.2. Definition

1. Procedures.
   Instruction or guidelines that must be followed in conducting activities to obtain a good result.
2. Emergency.
   A situation that is different from the normal situation that tends or has the potential to endanger the safety of humans, property, and the environment
3. Emergency Procedures.
   Procedures/guidelines in handling the emergency to prevent or reduce further or more significant losses.

1.3. Types of Procedures in Handling Emergencies

1. Internal Procedure/ Local Procedure.
   This procedure is addressed to each department, with the emergency that occurred can be handled by the department concerned without involving other ships or local port.
2. General Procedure/ Main Procedure.
   This procedure is the general guideline for the company as a whole and involves an emergency that is larger or at least can endanger other ships or port.

   In terms of response, it requires a lot of mobilization of human resources or involving ships/local port authorities.

1.4. Types of Emergency Situation

A ship, a floating structure that moves with driving force at various speeds crossing several areas in a certain period, will experience various problems caused by various factors, such as weather, ship line, condition of shipping lanes, humans, or other ships that human capabilities cannot predict, and it might disrupt the shipping.

The shipping disruption is a typical problem that can immediately be handled, but sometimes it needs direct assistance from certain parties, or sometimes the disruption can cause the captain and all crew members to be involved in handling the problem or, to be worse, they need to abandon the ship.

Based on their situation, the condition of the ship's disruption can be categorized into some emergencies according to the type of incident. The emergency can be classified as follows:

1. Collision (figure 1).
2. Fire/explosion (figure 2).
3. Grounding (figure 3).
4. Leakage/Sink (figure 4).
5. Man overboard (figure 5).
6. Pollution (Figure 6).

Emergency on board can harm the captain, all crew members, the ship owner and environment; moreover, it can cause a problem for the underwater ecosystem. Therefore, it is necessary to understand the emergency properly to have the basic ability to identify the emergency signs so the situation can be handled by the captain and ship's crew and collaborate with related parties.

1.4.1. Collision

Collision happens because a ship collides with another ship or ship with the dock or with particular objects that may cause damage, human casualties, oil spills to sea (tanker ship), pollution, and fires.

Another situation that may happen is panic or fear from the crews that may slow down handling the safety, rescue, and emergency.

1.4.2. Fires

Fire on board can occur in various fire-prone locations, for example, engine room, cargo hold, storage of ship equipment, electrical installation, and accommodation room of captain and crew.

An explosion occurs because of fire or, conversely, the fire occurs because of the explosion. Both may cause emergencies and need to be handled.

An emergency in fire and explosion are different from an emergency in a collision because in this situation, there are hot condition and limited space for movement, panic and unprepared condition from the officer to handle the situation, the equipment used is not proper, or the changed position of the equipment.

1.4.3. Grounding

Ship grounding generally begins with the signs of heavy propeller rotation; the smoke in the funnel suddenly blackens, the hull vibrates, and the ship's speed changes and then stops suddenly.

When the ship aground and does not move, the ship's position will depend on the surface of the sea or river. The situation inside the ship will also depend on the ship's condition.

On the ship grounding, it may happen leakage, pollution, or sinking if the water flood cannot be overcome. Moreover, the danger of fire will possibly occur if fuel or oil is connected with a damaged electrical network that can cause fire and it is not detected so that the fire might happen.

The possibility of human accidents due to ship grounding may occur because of unexpected situations or falling when a ship's position changes.

Ship grounding can be permanent or temporary depending on the position of the surface of the sea or river, or it depends on how to handle it. This emergency will make the situation in the ship's environment will be complicated.

1.4.4. Leakage/Sink

Leaking in the ship may occur because the ship is aground. It also may occur because of a collision or fire. Sometimes, it occurs because of the

damage to the metal plate of the ship because of corrosion. If the condition cannot be handled immediately, the ship will sink.

The water entering quickly, the limited ability to handle leakage, and the listing position of the ship made the situation difficult to handle. This emergency will be complicated if decision maker and the implementation are not fully supported by all crew members that the efforts to handle the situation are not based on the principles of safety and togetherness.

1.4.5. Man Overboard

Man overboard is one form of accident that makes a situation become an emergency while doing evacuation of the victim.

The help given is not easy because it will depend on the weather conditions and the ability assist, as well as the available facilities.

1.4.6. Pollution

Marine pollution can occur because of garbage disposal and oil spills while bunkering, waste disposal of a tanker ship, waste disposal of engine room exceeding 15 ppm, and the tanker ship which spilled due to collisions or leakage.

The attempt to overcome the pollution is difficult because overcoming the pollution requires equipment and trained man. Moreover, there may be some risks that need to be covered by parties that violate the provisions on pollution prevention.

CHAPTER II.
STEPS IN EMERGENCY RESPONSE

Specific Instructional Objective: This chapter will help you to understand steps in handling the emergency.

This chapter will discuss plans, the emergency response plans, actions taken, and signs used in handling emergencies.

2.1. Emergency Plans

1. Preparation.
   Planning and preparation are the main requirements to handle emergencies on board successfully.

   The captain and ship's officers must be aware of what they have to do in various emergencies, for example, fires in cargo tanks, engine rooms, and ratings' cabins; people get fainted in tanks; ships unfastened from the dock and drifting; the way of the ship is unfastened from the dock and so on.

   There must be quick and accurate decision about what to do to deal with all kinds of emergencies.

   Data/information that must be ready anytime:

   a. Type, quantity, and arrangement of cargo.
   b. Whether there are any hazardous chemical liquids.
   c. General arrangement of the ship (figure7) and ship stability information.
   d. Firefighting equipment plan.

2. Emergency response organization.

   An emergency response organization must be formed for emergency operations.

   The goals and objectives of the organization for each situation are to:

   a. Turn on the alarm.
   b. Find and estimate the level of the incident and the possible danger.
   c. Organize human resources and equipment.

   There are four planning guidelines that must be followed:

   a. Command center.

      A group that controls activities under the captain or senior officer and is equipped with internal and external communication tools.

   b. Emergency response unit.

      A group of senior officers who can estimate the situation, report to the command center, suggest what action to take, and from where the help is needed.

   c. Supporting unit.

      This supportive group is under the officers who must always be ready to assist the leading group under the command center orders and provide support assistance such as equipment, supplies, and medical assistance, including respiratory support equipment.

   d. Engineer group.

      A group under the supportive unit of the chief engineer or senior engineer that provide assistance based on the central command orders.

      The primary responsibility is in the engine room and can provide assistance when needed.

3. Initial action.

A person who finds an emergency must sound the alarm, report it to the officer on duty then prepares the organization. Meanwhile, those on the spot take immediate action to control the situation until the emergency organization takes it over. Everyone must know where they are and their duties, including the supportive group that must stand by waiting for further orders.

4. Fire alarm of the ship.
   While at the station, this alarm must be followed by several long blasts with an interval of not less than 10 seconds.

5. Fire fighting equipment plan.
   This equipment plan must be displayed in a visible place on every deck

6. Supervision and maintenance.
   Because firefighting equipment must always be ready to be used at any time, it is necessary to have regular checks carried out by the officers who are the responsibility is to maintain/repairing or filling the extinguisher on time.

7. Drills.
   In maintaining the skills and readiness of the crews, it is necessary to conduct drilling, either theory or practice, periodically and regularly. If possible, conduct joint drilling or meetings with some firefighters who work on the territory to exchange information about the number and location of fire extinguishers. It aims to facilitate the execution if there is a fire on board.

   The advantages of forming an emergency response organization include:

   a. Duties and responsibilities are not too complicated because they are carried out together, and each person has the different role.
   b. Duties and responsibilities can be defined clearly. So, it can reduce undisciplined actions.

c. There is only one leader (command). Therefore, orders, instructions, and others will be more focused, organized, and integrated, avoiding confusion.
d. It can avoid the formal hierarchical barriers in the company because all the needed officers from various fields have been joined in one form of organization.
e. If there is a failure while carrying out certain tasks, the problem can be reviewed again for repair.
f. With the existence of the emergency response organization, all individuals felt connected.

2.2. The Design of Emergency Response

Emergency response should be based on an integrated design that can integrate activities or efforts to overcome the emergency quickly, precisely, and under control with support from relevant agencies, human resources, and available facilities.

Understanding this emergency response design will get some benefits as follows:

1. Preventing (eliminating) the possibility of damage due to the widespread occurrence of the emergency.
2. Minimizing material and environmental damage.
3. Controlling the situation (under control).

Preventing the emergency need several essential steps of anticipation, which consist of:

1. Collecting data.
   In handling the emergency, it always decides what action to take to overcome the accident, so it is necessary to collect data to find out whether the emergency can endanger humans (seafarers), ships, and the environment and how to handle them adjusted with the available facilities and infrastructure.

   Steps in collecting data:

a. The level of ship damage.
b. Disruption of the safety of the ship (stability).
c. Human safety.
d. Cargo conditions.
e. Effect of damage on the environment.
f. Possibility of endangering the dock or other ships.

2. Equipment.
   The facilities and infrastructure that will be used are adjusted to the emergency by observing the ability of ships and humans to escape from the emergency until back to normal.

   Officers or ratings involved in this emergency operation should be able to cooperate with other parties when necessary (port, another ships/SAR team).

   Overall equipment used in an emergency are:

   a. Breathing Apparatus (figure 8).
   b. Fireman Outfit (Figure 9).
   c. Communication Tools (Figure 10).
   d. Alarm.
   e. Stretcher (figure 11).
   f. Other equipment adjusted for the emergencies.

3. Working mechanism.
   Every ship must have teams whose jobs are planning and implementing in handling emergencies. These emergencies must cover all aspects of the actions that must be taken during the emergency, and it must be discussed with port authorities, firefighters, state officers, and other agencies related to mobilizing human resources and preparing the procedures and responsibilities, organization, communication, control center, its inventory, and the detail location.

Procedures and actions to be taken include:

1. Preparation, in the form of preparatory steps, is needed in dealing with the emergency based on the type and incident.
2. Practical procedures for handling incidents must be followed by several integrated activities/parts.
3. A solid organization with good communication and responsibilities.
4. The implementation should be based on 1, 2, and 3 effectively and integrated.

The above procedure must cover all kinds of emergencies, whether fire, grounding, pollution, and others and must be adequately understood by trained crews and can be appropriately implemented.

All of the activities mentioned above are the working mechanism that can be quickly followed by management on board so that activities of handling emergencies can be done step by step effectively, safely, smoothly, and with a wise allocation of costs. Therefore, the active role of crew members depends on the individual's ability to understand the existing working mechanisms and the sense of responsibility based on the principle of togetherness in the social life on the ship.

The working mechanism created in an emergency is certainly very different from a normal situation. High mobility always characterizes emergency situation with a scope of work that usually cannot be limited by time because of safety demands.

Therefore, loyalty to standard safety always occurs because of work morale and a sense of togetherness.

2.3. Introduction to Distress Signal (Figure 12)

A sign to alert a ship's crew about an emergency or danger is by sending a distress signal.

According to international regulations, distress signals that are generally used for ships are as follows:

1. An explosive signal is sounded at the interval of about one minute.
2. A continuous sounding by fog signaling machines (figure 13).

3. Rockets or shells of light, throwing red stars fired one by one at short intervals.
4. A signal made by radiotelegraphy or any other signaling system consisting of the group of SOS from the morse code (figure 14).
5. A signal sent by radiotelephony consisting of one word spoken, "Mayday".
6. The International Code of distress Indicated by NC (figure 15).
7. A signal consisting of a square flag having above or below it a ball or anything resembling a ball.
8. Flames on the vessel (as from oil barrels or others that are burning).
9. A rocket parachute flare or a hand flare showing a red light.
10. A smoke signal giving off orange-colored smoke.
11. Slowly and repeatedly raising and lowering arms outstretched to each side (figure 16).
12. The radiotelegraph alarm signal.
13. The radiotelephone alarm signal.
14. Signals transmitted by radio beacons indicating the emergency position.

The possibility of emergencies on board may happen. The distress signal that is generally signed:

1. Fire signal.
   If a fire occurs on board, the one who sees the fire must report it to officers on watch on the bridge.

   The officer on duty will continue to monitor the effort's progress to extinguish the fire. If the fire cannot be controlled with portable extinguishers (figure 17) and it seems necessary to use standard fire fighting equipment and requires the role of all crew members, then on the decision and orders of the captain, the fire signal must be sounded with a horn code or one short and one long bell continuously as follows:

   ._____._____.___._____

Every crew member who hears the fire signal must carry out their duties under their role in the muster list action and immediately go to the place of duty to wait for further orders from the fire fighter commander.

2. Abandon ship signal.
   In an emergency that requires the captain and all crew members to abandon the ship, the signal code used is sounded through the bell or the ship horn as many as 7 (seven) short and one long continuously as follows:

   ..... __.....__.....__

3. Man overboard signal.
   During shipping, people may fall into the sea. If a crew member sees people falling into the sea, the following actions must be taken:

   a. Shout "Man overboard".
   b. Lower the lifebuoy.
   c. Report to the officer on duty.

   Furthermore, the officer on duty who receives reports of a man overboard can maneuver the ship to rotate to follow the direction of the "Williamson Turn" (figure 18) or "The Scharnow Turn" (figure 19) to evacuate the victim.

   If the victim cannot be helped, the ship must raise the international flag with the letter "O" (figure 20).

4. Other distress signals.
   In certain cases, when there is an accident or an urgent emergency that considerably needs urgent help from other parties, each crew member must immediately give a sign of attention by ringing a bell or other object or shouting for help.

   This action is intended to give help as soon as possible so that the victim can be immediately helped, prevent other victims from accidents, and prevent the accident or danger from becoming severe. In a state of danger or emergency, the equipment that can

be used are tools or machines as well as electronics that can be operated in these conditions.

A ship is designed to be operated under normal and emergency conditions. Therefore, the ship is also equipped with engines or electronics that can be operated in emergency conditions.

The machines or electronics that can operate in an emergency consist of:

a. Emergency steering gear.
b. Emergency generator.
c. Emergency radio communication.
d. Emergency fire pump.
e. Emergency ladder.
f. Emergency buoy.
g. Emergency escape trunk.
h. Emergency alarm at the refrigerator, cargo space, engine room space, and accommodation space.

Each machine or electronic mentioned above has been set based on the provisions of SOLAS 1974 on setting and capacity or operational capability.

For example, the Emergency Fire Pump must be installed outside the engine room, have a working pressure of 3-5 kilograms per square centimeter, and be driven by a separate propulsion force. So that when the main fire pump cannot be operated in an emergency, the only alternative is to safely use the emergency extinguisher pump outside the engine room.

CHAPTER III.
ACTION IN EMERGENCY

Specific Instructional Objectives: This chapter will help you to understand what to do in an emergency.

This chapter will discuss action, equipment used, and special procedures in handling emergencies on board.

3.1. Action in Emergency

3.1.1. Muster List (figure 21)

In an emergency or dangerous situation, every crew member must take action under the provisions of the muster list. Therefore, the muster list is made and informed to all crew members.

The muster list of ships needs to be displayed in strategic places, suitable, easily accessible, easy to see, and easy to read by all crew members and provide details of procedures in case of emergency, such as:

1. Specific tasks that must be handled in an emergency situation by each crew member.
2. Muster list, besides showing specific tasks, also shows the muster station (where crews need to go when there is an emergency).
3. Muster list addressed to passengers must be made under the fixed form from the government.
4. Before leaving, a muster list must have been made, and the copy must be displayed in several strategic places on board, especially in the crew room.

5. In the muster list, there are lists of different tasks of the crews, such as:
    a. Close watertight doors, valves, mechanical parts of draining systems on ships, etc.
    b. Prepare equipment for lifeboats, including portable radio sets and other equipment.
    c. Lower the lifeboat.
    d. General preparation of the safety equipment.
    e. Prepare assembly point in an emergency for passengers.
    f. Prepare fire fighting equipment, including fire control.
6. In addition, the muster list mentions some particular tasks that should be carried out by the crew of the Catering Department (chef, waiter, etc.), such as:
    a. Give a warning to passengers.
    b. Observe whether they wear their life jacket correctly or not.
    c. Gather the passengers at the emergency assembly point (muster station).
    d. Observe the movement of passengers and provide direction to the corridor or the ladders.
    e. Ensure that the supply of blankets has been carried by lifeboats/life rafts.
7. Relating to fire fighting, the muster list provides instructions on methods that are usually conducted when a fire occurs and specific tasks that must be carried out relating to fire fighting operations, equipment, and installations fire fighting on ships.
8. The muster list must differentiate certain calling signs for crew members to enter their lifeboats, on life rafts, or to enter the muster station to extinguish fires. These signs are given using the ship's horn or siren, except on passenger ships conducting short international voyages and on cargo ships of less than 150 feet (45.7 m) in length, which must be equipped with electronic signs, and all signs are sounded from the bridge.

The signs to assembly in an emergency consist of 7 short blasts followed by 1 long blast using a ship's horn or siren, and as an addition to these signs, it may be accompanied by a continuous sound of a bell or gong.

When the signs are sounded, everyone on board should wear warm clothes and swimsuits and head to their muster station. Crews carry out their duty in emergency locations according to what is stated in the muster list and then wait for orders.

Each helmsman and crew of the ship went to the lifeboat and:

a. Open the lifeboat cover, fold it, and put it in the lifeboat (the modern ship's lifeboats don't have a cover anymore but are left open).
b. Two people in the lifeboat, one at the front, set the painter line and one at the back set the lifeboat prop.
c. The painter line is attached to the front as far as possible but still inside the lifeboat and outside of other ropes, then tightened.
d. Check whether all crew members and passengers have worn a life jacket correctly/not.
e. Wait for the next order.

To be able to act in an emergency, each crew member must know and have skills in using life safety equipment at sea and be capable of using lifeboats and their equipment and fire fighting equipment.

Whereas the individual boat drills and fire drills are intended to master and to have all aspects relating to characteristics of the safety equipment and fire fighting equipment, which include knowledge and skills about:

1. Boat drill.
    a. Alarm signal to abandon ship.
    b. The location of life jackets and how to use it for crews and passengers.
    c. The readiness of the lifeboat equipment.

d. The distribution of the crew's tasks in each lifeboat consists of commanders and deputy commanders, engineers, helmsman, opening lashing and lifeboats cover, installing water ropes/tiller/monkey line/prop, carrying blankets/logbook/ first aid kit/removing hook/releasing hook/ rolling up emergency ladders/help passengers.

2. Fire Drill
   a. Alarm signal of fire on board.
   b. The distribution of the crew's tasks consists of:
      The firefighters brought a hose, fire bottle, axe, crowbar, sand, and fireman outfit, while the officer and helmsman on duty on the bridge closed watertight doors and windows, brought a log book, and CO2 installation, operated a fire pump, brought first aid kit.

3.1.2. Safety Equipment at Sea

There are some safety equipment at sea, including:

1. Life-Saving Appliances: Life Boat (figure 22), Life Jacket (figure 23), Life Raft (figure 24), Life Buoy (figure 25), Line Throwing Apparatus (figure 26), Life Line, Pyrotechnic (Parachute Signal, Red Hand Flare, Orange Smoke Signal) (figure 27).
2. Fire Fighting Equipment: Emergency Fire Pump, Fire Hydrants, Hose & Nozzles, Fire Extinguisher (Fixed and Portable), Smoke Detector and Fire Detector System, CO2 Installation, Sprinkler System (Automatic Water Spray), Axes and Crow Bars, Fireman Outfits and Breathing Apparatus, Sand in Boxes.

3.2. Particular Procedures in Emergency Procedures

1. Imminent collision.
   a. Sounded the emergency alarm.
   b. Give sound and light signals as mentioned in the Collision Regulations 1972.
   c. Report it to the captain.

d. Report to the engine room.
e. Manoeuvre ship to minimize effects of the collision.
f. Watertight doors and fire doors automatically closed.
g. Switch on deck lighting.
h. Stand by at VHF on Channel 16.
i. If a collision occurred:
    1) Observe and analyze the situation (if possible, take pictures).
    2) Contact other vessels and give relevant information about the collision.
    3) Hold other vessels responsible for the collision.
    4) If possible, offer assistance to the other vessel.
    5) Collect information.
        a) Make sure the log book has been properly kept.
        b) Do not erase any information on the working chart (times, positions, courses steered, logs, etc.).
        c) Ensure that the movement book is properly kept in ink.
        d) Collect the record (printout) of the course and the alteration movement from the telegraph.
        e) Note the exact time of the collision, the heading of the vessel at the time of the collision, the angle of blow-by or to the other vessel, the speed of each vessel at the time of the collision, and any alteration of speed and course before the collision.
j. The vessel's position information is available in the radio room, and it is updated if there is a change using the satellite terminal and other automatic distress transmitters (GMDSS).
k. Evaluate risks of pollution.
l. After the collision, the bilges and tank are sounded.
m. Check the stability of the ship.
n. Inform the company.
o. If it is necessary, notify other vessels in the surrounding.

p. In case of fire, refer to the fire checklist.

q. Evaluate the possibility of abandoning the vessel.

r. Implement repair/treatment if it occurs injury or damage.

Note:

See "The master's Role in Collecting Evidence," which includes a checklist in case of a collision.

2. Grounding, stranding.
Stranding/Grounding can occur for several reasons:

a. Bad navigation.

b. Faulty navigation instruments.

c. Bad weather.

d. Engine breakdown, etc.

In case of stranding/grounding, take at least the following actions:

a. Stop engines immediately (so the ship runs aground with very little speed on a very soft bottom with minimal slope) and that nobody on the bridge or in the engine room has felt it.

b. Sound general alarm.

c. Close the watertight doors.

d. VHF is maintained on channel 16.

e. Broadcast the information to other vessels.

f. Sound signals, light/shapes to be shown (especially in the case of foggy conditions).

g. Switch on the deck lighting.

h. Check position on the chart.

i. Note any supporting information (time, course steered, speed, log, eventual maneuvers, etc.).

j. Sound bilges, tanks around the ship.

k. Immediately do soundings the waters around the vessel to check what type of sandbank the ship is lying on.

l. If the ship runs aground on top of a flat sandbank, the danger of breaking/leaking is minimal. However, if the ship lies on the coral water, the risk of damage is real, and the pressure on the ship is enormous.
In that case, urgent action must be taken:

1) Try to free the ship by giving full astern (or full ahead) with successively the rudder to hard starboard and hard port (a lot depends on the type and size of the ship).
2) Call the assistance of tug boats.
3) Consider jettison of cargo (to throw the cargo overboard). Be careful of the risk of pollution.

m. Evaluate risks of pollution.

n. Inform company and any third parties if relevant (P & I Club, Hull underwriters, port authorities, etc.).

o. Update the vessel's position in the radio room, satellite terminal, and other automatic distress transmitters (GMDSS).

p. Consider the danger of the situation and, if possible, take pictures

q. Consider further actions with consideration for:

1) Evacuation.
2) Risks of sinking (emergency message, EPIRB, abandon ship).
3) Secure position (change of tide, weather, stream, risks, and stability).
4) Assistance, port of refuge, oil spills.

r. Always inform the company.

s. Always record every action in the logbook.

1 Fire.

Fire at Sea:

a. Sound the general alarm (advised by master and officer on watch).

b. Muster's list of fires is operated and based on a written order.
c. Close doors and stop ventilation.
d. Localize fire and notify personnel concerned with the scat of fire.
e. Identify cargo, dangerous cargo, and substances in the vicinity.
f. Analyze the proper method to extinguish the fire.
g. Analyze the cause of the fire and the limited capability to extinguish.
h. If necessary, consider abandoning the ship and bring all important documents to be saved.
i. Inform to company and other third parties.
j. Once successfully extinguished, send a cancellation message.
k. Record all activities in the logbook.

Fire in Port

a. Sound general alarm (advice Master and officer on watch).
b. Stop cargo operations.
c. Muster's list of fires is operated and based on a written order.
d. Notify terminal and relevant parties and request external extinguishing help.
e. Close doors and stop ventilation.
f. Localize fire and notify personnel concerned with the seat of the fire.
g. Identify cargo, dangerous cargo, and substances in the vicinity.
h. Analyze the cause of the fire and the limited capability to extinguish the fire.
i. If necessary, consider abandoning ship and bring all important documents to be saved.
j. Inform the company and other third parties (P & I Club, Hull underwriters, the cargo agent, and others) if the company hasn't taken action.

k. Once successfully extinguished, send a cancellation message.

l. Record all activities in the logbook.

4. Flooding.

Flooding can occur at sea due to some reasons:

a. Collision with an object that is adrift and which could not be observed (especially at night).

b. Touch and go.

c. Bad weather conditions.

d. Excessive pressure on the vessel (e.g., due to distribution of cargo, the inaccurate fuel and/or water, etc.).

e. Poor maintenance of the hull and other structures of the ship, etc.

In case of flooding, at least the following actions should be taken:

a. Sound general alarm.

b. Show "Not under command" shapes or lights.

c. Reduce speed.

d. Close watertight doors.

e. Update vessel's position in the radio room, satellite terminal, and other automatic distress transmitters (GMDSS).

f. Sound bilge, tanks, and check leakage.

g. Consider a change of trim.

h. Check the vessel's stability.

i. Consider the necessity of assistance.

j. Inform vessels in the vicinity.

k. Consider emergency call/message.

l. Consider beaching or abandoning the ship.

m. Prepare lifeboats.

n. Inform the company and, if relevant, any third party (such as P & I Club, Hull underwriters, agents, etc. (if the company hasn't taken action).

o. If relevant, contact AMVER.

p. Once the condition is improved, inform all parties concerned.

q. All actions must be recorded in the logbook.

5. Abandon ship.
   a. Sound general alarm.
   b. Follow muster alarm list.
      1) Each crew member should have their lifejacket on.
      2) Each crew member should immediately proceed to muster station to prepare the lifeboats or to start to clear away the inflatable life rafts.
   c. The responsible officers should regularly report to the master.
   d. Update vessel's position in the radio room, satellite terminal, and other automatic distress transmitters (GMDSS).
   e. Send distress message/alert to other vessels.
   f. Check the number of crews and passengers present.
   g. Search for missing personnel (especially in the engine room and at night in accommodations).
   h. Activate EPIRB.
   i. Manoeuvre vessel in proper position/stop engine.
   j. If possible, bring all-important ship's documents (especially the log book).
   k. After the rescue, inform the company.
6. Man overboard.
   a. Inform bridge immediately at which side of the ship the person fell (starboard or port or after).
   b. Sound general alarm/inform Master.
   c. Release lifebuoy with light, flare or smoke signal.
   d. If possible, keep the person in sight/post to look-out.
   e. If the person is not visible, apply the Boutakoff method.
   f. Inform engine room and start maneuvering.

g. Position of life buoy and vessel are recorded starting from when the search start.

h. Alert other vessels.

i. Send the following radio message:
Name of ship, Position, Course steered, Time, Man overboard. Please keep a sharp look-out.

j. Sound signals (three long blasts) exhibit the flag "O".

k. Prepare rescue boat.

l. If relevant, inform AMVER.

m. Control the maneuver to rescue (if the place is possible to have maneuver, it is suggested to use Williamson Turn).

n. Prepare the action.

o. Inform company.

p. When successfully rescued, inform all parties.

q. Record all relevant actions taken in the logbook.

7. Search and rescue.
   a. Take DF bearing of distress message.
   b. Re-transmitted distress message or SOS.
   c. Continuously listen to all distress frequencies.
   d. See Merchant Ship SAR Manuals (MERSAR).
   e. Establish Communication between SAR of sea units and SAR of aircraft units on 2182 kHz and/or Channel 16.
   f. Plot the position, courses, and speeds of other assisting units.

3.3. Emergency and Distress Drills

1. On passenger ships, lifeboat and fire drills must be conducted once a week if possible. The above exercises must be conducted before leaving at the last port for long-distance international voyages.
2. On cargo ships, lifeboat and fire drills should be conducted once a month. The exercises above must be done within 24 hours after leaving a port where the crew has replaced more than 25%.

3. The exercises mentioned above must be recorded in the ship's log book. If the drills are not conducted within 1 week (passenger ships) or 1 month (cargo ships), it must be recorded in the log book with the reasons.
4. On passenger ships of long-distance international voyages, within 24 hours after leaving the port, it must conduct drills for handling emergencies.
5. Lifeboats of emergency response must be used in turns during the drills and, if possible, lowered into the water within 4 months. The drills must be conducted in such a way so that the crew members understand and gain experience in performing their duties, including instructions on operating life rafts.
6. The distress sign for passengers to gather at muster stations must consist of 7 or more short blasts followed by long blasts using the ship horn continuously. On passenger ships, long-distance international voyages must be added with signs operated electrically.
7. The purpose of all signs relating to passengers and other instructions must be clearly stated on board in an understandable language (Indonesian, English) and posted in the passenger cabin and other rooms for passengers.

CHAPTER IV. THE SEQUENCE OF ESCAPE IN AN EMERGENCY

Specific Instructional Objectives: This chapter will help you to understand the sequence of escape in an emergency situation.

This chapter will discuss the sequence of escape in an emergency on the ship and the instructions.

4.1. Understanding the Escape Route (Figure 28).

In an emergency, panic often occurs; as a result, it is sometimes difficult to reach a particular place, for example, a lifeboat. For this reason, seafarers, especially crew members, must know well the escape routes, communication in the ship itself, the alarm system, and the muster station (figure 29).

For this reason, according to the provisions of SOLAS 1974 CHAPTER II-2 on construction protection of discovery and fire fighting in regulation number 53, it is required for all crew rooms, passenger rooms, and rooms that are used by the crew on duty to have ladders inside and from those rooms, also an arrangement of ladders in the engine room. There must be ladders to or from that area in an emergency.

On ships, emergency escape routes can be found at certain places such as:

a. Engine room.
   There is an escape route to the ship's deck through the tunnel of the propeller. Along the path is led by the words "Emergency Exit" followed by an arrow or symbol of a running person.

b. Accommodation room.
   In accommodation rooms, especially in the entertainment room or messroom for crew members or areas where the crew gathers, it is always equipped with an emergency door or emergency window that says "Emergency Exit".

   Each crew member must know and be capable of using these emergency routes so that in conditions that are impossible to use of the available public route, those routes can be used as the emergency routes.

   In addition, for their safety, all crew members must pay attention to signs that guide everyone to go, enter, or pass through the emergency corridor in an emergency. Negligence or carelessness will cause harm to themselves and involve other people.

4.2. Signs.

The access to the emergency exit is marked with a white arrow on a green board. On a passenger ship, between the passengers' cabins and crews' cabins, it must be a ladder or access leading to the embarkation of the lifeboat deck and lifeboat. If the room is under a bulkhead deck, there are two escape routes from the underwater space, and one must be free of watertight doors. Where the room is above the bulkhead deck of the central vertical zone, there must be a minimum of two escape routes. From the engine room, there will be two escape routes made of steel ladders separated from one another.

4.3. Internal Communication and Alarm System.

In an emergency, an efficient communication and alarm system is essential. For this reason, as an emergency communication to abandon the ship, use sound from a bell or siren, or it can also be used by mouth. As a signal, it consists of seven short or more blasts followed by one long blast of a horn/siren or electric bell.

FIGURE APPENDICES

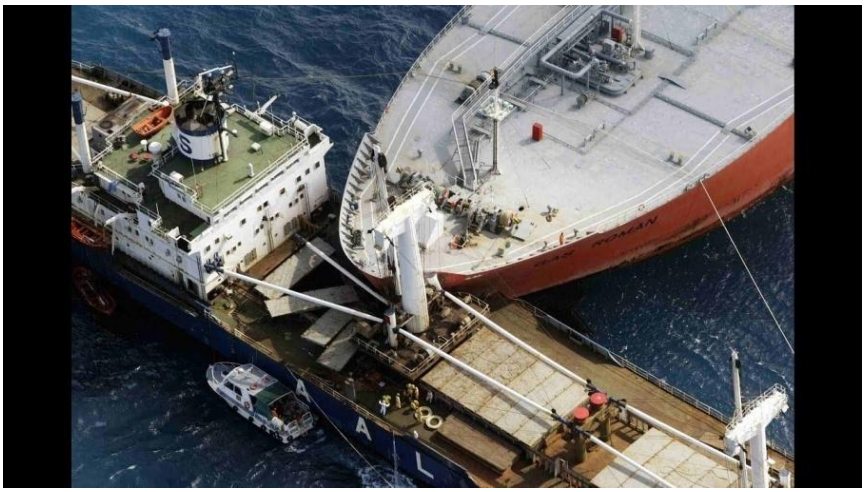

Figure 1. Collision

Figure 2. Fire

Figure 3. Grounding

Figure 4. Flooding

Figure 5. Man Overboard

Figure 6. Oil Pollution

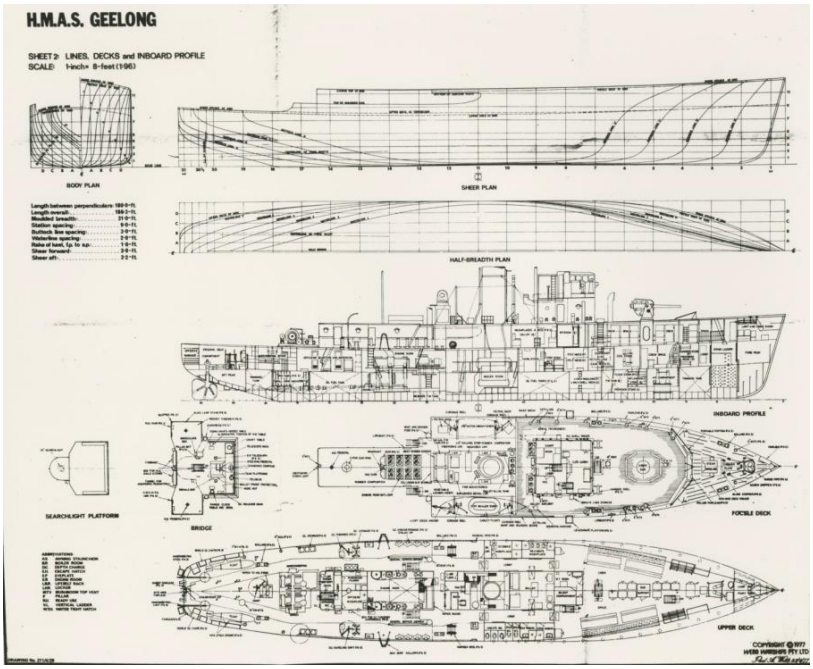

Figure 7. General Arrangement

Figure 8. Breathing Apparatus

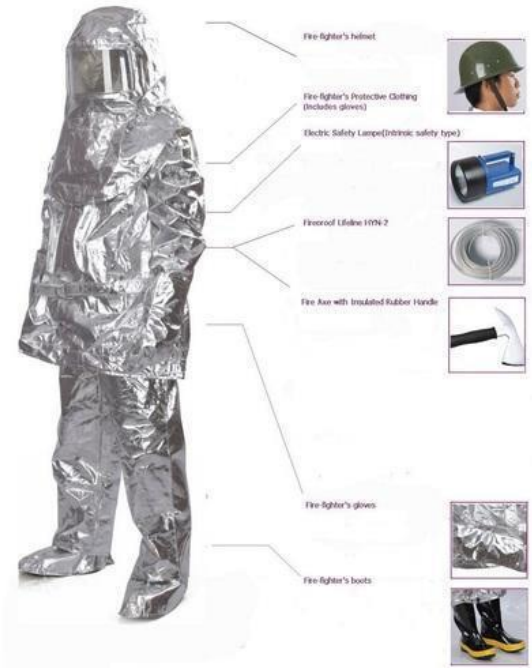

Figure 9. Fireman Outfit

Figure 10. Communication Tools

Figure 11. Stretcher

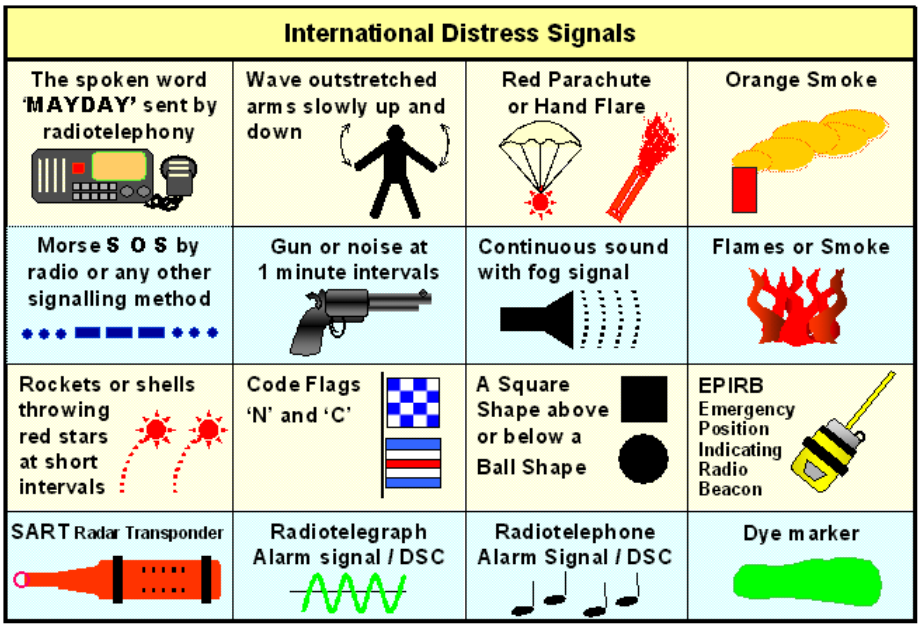

Figure 12. Distress Signal

Figure 13. Fog Signal

Figure 14. Morse Code Transmitter

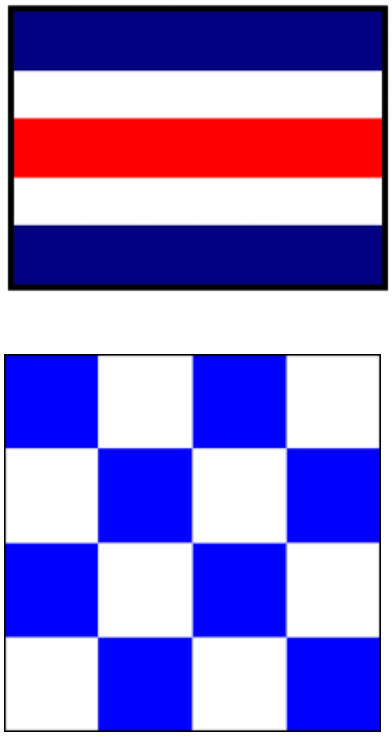

Figure 15. Flag Signal "NC"

Figure 16. Upper and Lowering Arm

Figure 17. Portable Fire Extinguisher

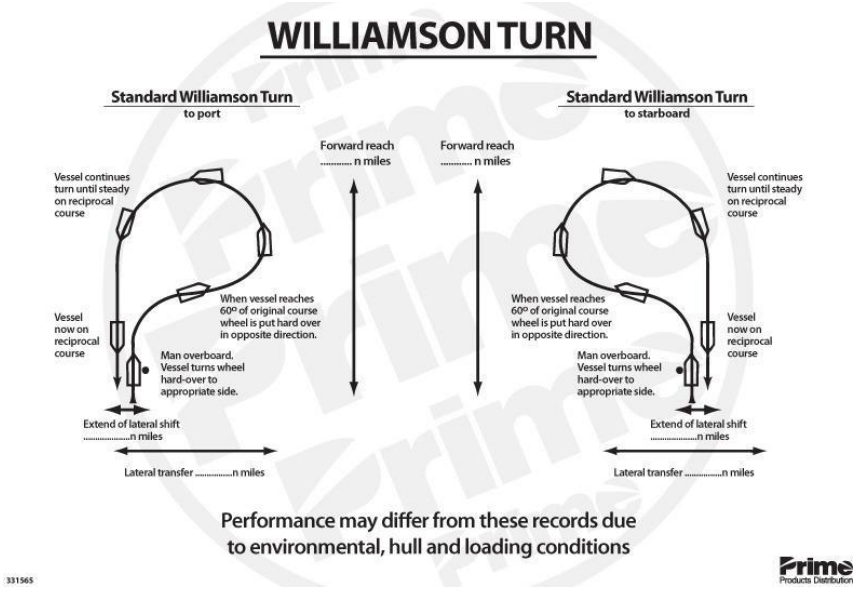

Figure 18. Williamson Turn

SCHARNOW TURN

Rudder hard over

After deviation from the original course by 240º, rudder hard over to the opposite side.

When heading 20º short of opposite course, rudder to midship position so that ship will turn to opposite course.

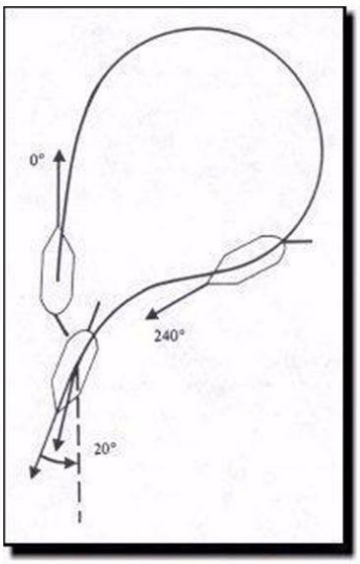

Figure 19. The Scarnow Turn

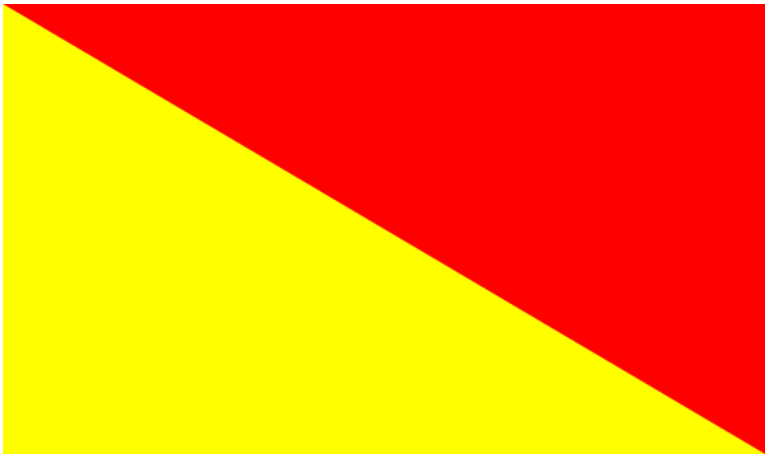

Figure 20. FLag "O"

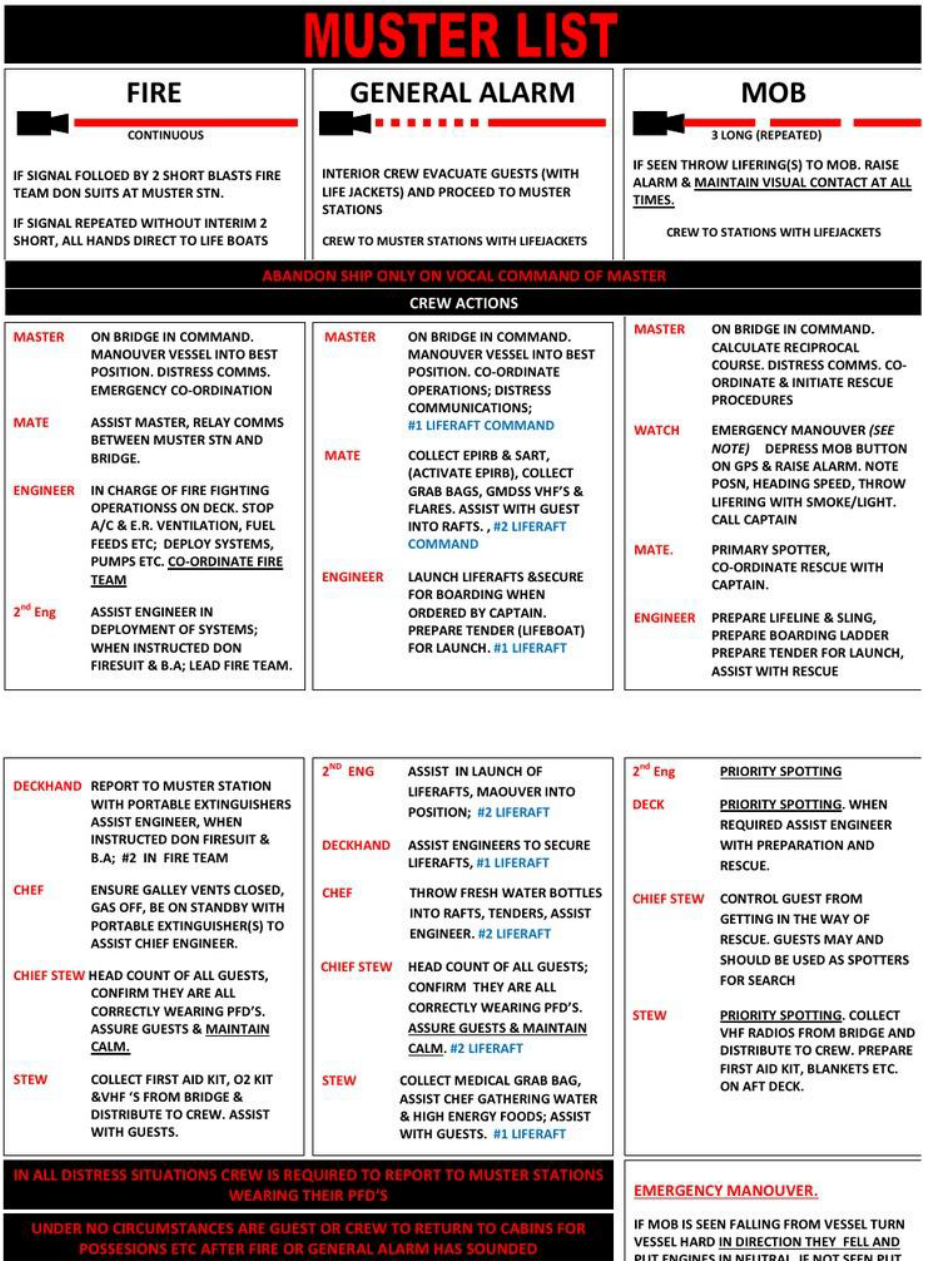

Figure 21. Muster List

Figure 22. Life Boat

Figure 23. Life Jacket

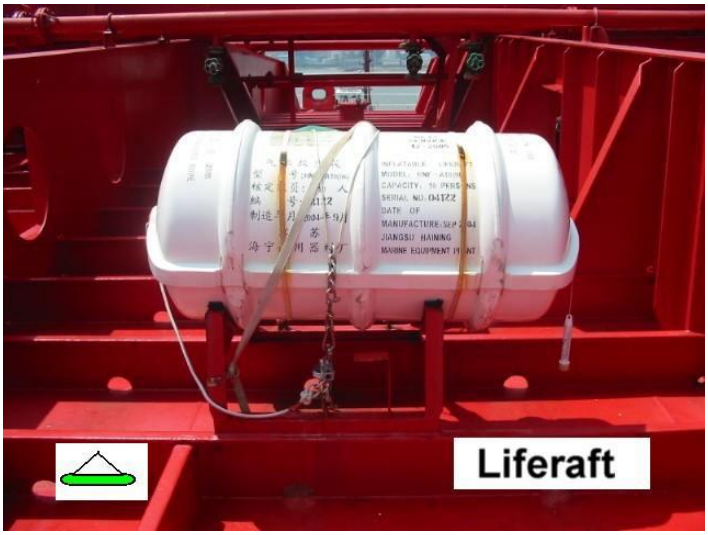

Figure 24. Life Raft

Figure 25. Life Buoy

Figure 26. Line Throwing Apparatus

Figure 27. Phyrotechnic (Parachute Signal, Red Hand Flare, Orange Smoke Signal)

Figure 28. Escape Route Symbol

Figure 29. Muster Station Symbol

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EMERGENCY PROCEDURES AND SAR

Emergency Procedures and SAR can be useful in increasing our knowledge and concept of how we sail with safety to the destination and how we take action when we experience an emergency. We realize that there is some lack and far from perfect. Therefore, we hope there will be criticism and suggestions for improving the textbook that can be made in the future; nothing is perfect without constructive criticism.

We expect that this simple textbook is easy to be understood for anyone who reads it. We hope that this book may be useful for me and anyone who reads it. We apologize if there some words that offends, and we ask for constructive criticism and suggestion from you to improve in the future.

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