



STCW Basic Safety Training Course Instructor Manual

1.19 Personal Survival

v.2020



1.19 PERSONAL SURVIVAL TECHNIQUES A-VI/I-1

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1.19 PERSONAL SURVIVAL TECHNIQUES A-VI/I-1

Module 1

Safety and Survival

Safety Guidance

Safety, above all, is the most important factor to observe while in training and working onboard. It is vital to avoid accidents that may result to personal injury, damage to property and environment, or untimely death. Information about maritime safety is found on the following sources, namely:

- training manuals;
- company safety manuals;
- SOLAS (ISM Code);
- training and drills
- computer-based training software (compact disk).

Emergencies, such as fire or collision, may occur on any ship. The four basic principles of survival in an emergency at sea are:

- participate in regular, realistic training and drills;
- be prepared for any emergency;
- know the actions to take during and after an evacuation;
- know the main dangers to survivors.

Regular Training and Drills

If an emergency occurs, such as fire, every crewmember must act quickly and appropriately. Regular training and drills provide realistic situations for practicing skills with emergency equipment and procedures. By taking part in regular training and drills, crewmembers gain confidence and understand more clearly their duties and how they fit into the emergency teams. Training at ship is noted in SOLAS manual.

Preparedness for any Emergency

You must be prepared to respond to an emergency at any time during the day or night. The muster list (station bill) specifies the emergency duties of each crewmember. Crewmembers must also know the:

- location of their own and spare lifejackets;
- location of fire alarm controls;
- escape routes;
- consequences of panic.

Know Emergency Actions

Each crewmember must know what actions to take when fire alarm or general emergency

1.19 PERSONAL SURVIVAL TECHNIQUES A-VI/I-1

alarm signal is sounded.

When an abandon ship has been announced, crewmembers need to know key survival techniques, from the first emergency signal to arrival on a survival craft. These techniques are divided into four categories:

- when called to emergency stations / muster stations;
- when ordered to abandon ship;
- when in the water (floating);
- when aboard a survival craft.

Know the Main Dangers to Survivors

Rescue may not occur immediately. Survivors need to help themselves and others to survive until help comes. After abandoning ship and while waiting for rescue, it is important to know the main dangers to survivor associated with the environment:

- hypothermia
- shark
- hunger
- Dehydration



IMO SYMBOLS AND SAFETY SIGNS



Module 2

Emergency Situation

Types of Emergencies

Two major types of emergencies that may occur on a ship are fire and foundering or sinking. Other emergencies that can lead to either fire or foundering are:

- collision
- stranding
- adverse reaction of dangerous goods
- shifting of cargo
- engine room explosion or fire
- structural failure

How to Respond to Emergencies

Collision - Navigating ships should always maintain a proper look-out. Ensure that lookouts posted are always on the alert. If collision happens and the danger is imminent, prepare immediately for abandon ship.

Adverse Effects of Dangerous Goods or Hazardous Bulk Materials - The ship carries different types of cargoes and some of the cargoes they carry may be toxic and hazardous to human lives. So when working with these types of cargoes, safety precautions must be properly observed. To avoid danger, breathing apparatus must always be used.

Shifting of Cargoes - Many ships had already sunk because cargoes shift from one side to another. Shifting of cargoes cause ship to list dangerously to the point that she cannot recover and subsequently capsize and eventually sink. To avoid cargo from shifting, proper lashing of cargoes should always be observed and frequently checked, especially during heavy weather.

Engine Room Explosion or Fire - Good housekeeping and preventive maintenance are a must to eliminate the possibility of such emergency from happening. Good housekeeping means keeping flammable materials away from heat source. Preventive maintenance would mean following the maintenance plan of various internal combustion engines and other equipment that are likely to explode.

Stranding - Safe navigation will prevent the likelihood that the ship may run into shoal waters. Navigators should be always ahead of the ship. Charts should be corrected / updated and low tides anticipated.

Structural Failure - This emergency can be prevented if the ship will not be subjected to excessive stress due to improper loading of cargoes.

Other Precautions against Emergencies

Many precautions are required by the regulations to make ships as safe as possible. The regulations vary for passenger and cargo ships and for ships of different sizes. Ships are inspected and certified to ensure that regulations are being followed. Some of the aspects covered by regulations are:

- structure of the ship;
- type and amount of emergency equipment;
- maintenance and storage of emergency equipment;
- communication systems;
- contents and display of muster stations;
- training of crew; and
- frequency of safety drills.

Dealing with Fire

The best defense against fire is a properly constructed and equipped ship, with a crew who practice fire prevention and are trained in the proper use of all fire-fighting equipment.



Preparations and Precautions against Fire

- **ship structure** - Constructed to limit the spread of fire from one compartment to another. Ventilation systems can cut off the supply of oxygen to a fire. Fire doors can be closed to confine a fire to one compartment. Fire-resistant materials are used in construction and furnishings. Machinery and electrical installations designed to ensure services that are essential for the safety of the ship are maintained under various emergency conditions.
- **safe practices** - General safe practices help to prevent fires in the engine room, the galley, accommodation areas and cargo spaces.
- **escape routes** - Regulations specify the size of stairways and landings and the structure of handrails. Escape routes must not be obstructed by furniture. There must be maps that show the “You are here” position and escape routes marked by arrows. Escape routes lead to the muster stations.
- **muster station and emergency plans** - The station bill or muster list describes the emergency duties of the crew, based on the emergency plan for dealing with fire. The muster list is posted throughout the ship, including the navigation bridge, the engine room and the crew quarters.
- **fire drills** - Held weekly to practice the emergency duties listed on the muster list.

Fire-fighting equipment must be kept in good order and be available for immediate use at all times. The equipment is distributed throughout the ship so that a fire in one area of the ship will not put the whole system out of action, or obstruct access to equipment or controls.

1.19 PERSONAL SURVIVAL TECHNIQUES A-VI/I-1

The fire-fighting equipment on a ship may include:

- fire-detection and alarm systems;
- communication systems;
- fixed fire-extinguishing systems;
- portable fire extinguishers; and
- protective gear for firefighters

Communication Systems

It is important for the Master who ultimately directs all emergency operations, to be able to communicate with the crew and passengers, other ships and shore authorities. This is done with:

- intercom;
- telephone;
- walkie-talkies (VHF radios);
- public address (PA) system;
- alarm bells; and
- ship's whistle.



Fixed Fire-Extinguishing Systems

As different types of extinguishing agents are needed for different types of fires, the type of extinguishing system used to protect a space depends on the type of fire that is most likely to occur in that space. These systems include:

- fire-main system;
- sprinkler system;
- carbon dioxide or halon systems; and
- foam systems.



Portable Fire Extinguishers

Portable fire extinguishers of the approved type and design must be provided in the quantity specified for the type and size of the ship.

Firefighter's Outfit

Protective gear for the firefighters include protective clothing, rubber boots and gloves, rigid helmet, self-contained breathing apparatus, electric safety lamp and axe.



Dealing with Foundering (Sinking)

The precautions taken as a defense against, or in preparation for foundering are similar to the precautions against fire.

- Ship structure- Ships are constructed to minimize the chances of foundering, even if the hull is damaged. They are divided into watertight compartments to keep the ship afloat and stable. There are pumping systems to remove water from the ship.
- Safe practices-cover a wide range, from the navigation equipment required on ships to the handling and stowage of cargo.
- Escape routes- The same escape routes that are used in case of fire are used in case of foundering. The escape routes lead to the muster stations where passengers and crew, assigned to help passengers, assemble in case of emergency.
- Abandon ship drills- held periodically, as required by regulations. Drills provide the opportunity for crew to practice their emergency duties and for passengers to practice the emergency instructions.

Crew Expertise

All seamen have already attended training before they are assigned on board ships. However, aboard ships, the training continues. Weekly drills are conducted for the purpose of making crew more effective in responding to all kinds of emergencies.

Shipboard Familiarization

Within the month when a seaman joins the vessel, regulations require the seaman to receive an approved ship familiarization conducted by an officer of the ship. This activity informs new or rejoining crew about safety procedures and facilities used and available onboard vessel. This knowledge prepares them to survive an emergency.

Muster List and Emergency Signals

The Muster list (station bill) is a required ship document posted in accessible places including navigational bridge, engine control room etc. It lists emergency duties and muster stations of crewmembers during emergencies. Muster list also describe the various emergency signals that the ship will use to indicate emergency situation. Most common are:

- fire alarm - -intermittent ringing of alarm bells;
- general emergency signal - seven short blasts and one long blast on ship's whistle / continuous ringing of alarm bells;
- abandon ship signal - Announcement " ABANDON SHIP " made by the Master through public address system

1.19 PERSONAL SURVIVAL TECHNIQUES A-VI/I-1

Crew and Emergency Instructions

As soon as possible after joining a ship, you must acquire knowledge of:

- meaning of emergency signals;
- instructions on the muster list;
- location and use of life-saving equipment;
- location and use of fire-fighting equipment;
- escape routes and equipment;
- emergencies involving the sinking of the ship;
- means provided for survival on ship/survival craft.

Extra Equipment and Survival

Survival crafts are provided with survival equipment and supplies, but if time permits, take the following from the ship:

- personal survival kit with personal necessities, such as prescription medicines and anything that might be helpful to survival (it should be waterproof and small enough to fit into a pocket);
- blankets, for warmth and shelter; and
- extra water and food.

Difficulties While Abandoning Ship

- unable to launch some of the survival craft - If the sinking ship list so badly, survival craft stowed on the other side (opposite the list side) may be difficult to launch.
- absence of lighting - Lack of lighting can cause confusion. You need to know, even without light, your emergency station.
- absence of personnel assigned to a certain duties - Crewmembers may be unable to report to their stations or may be forced to abandon them due to damage, fire, smoke, personal injury or other factors. In this situation, crew may have to perform someone else's duties. During drills all crewmembers should watch each other to become familiar with the duties of others and to be prepared for whatever needs to be done.



1.19 PERSONAL SURVIVAL TECHNIQUES A-VI/I-1

Module 3

Evacuation

Abandoning Ship - Last Resort

Abandoning ship in the open sea is an action of last resort. All reasonable efforts required of mariners for the saving of their ship must clearly have failed before any decision to abandon the vessel will be taken. The decision to abandon ship is made only by Captain or Master. Only when there is no reasonable chances of saving the ship will the order ever be given to abandon it. Never abandon ship unless ordered by the Master of the ship.

The signal to abandon ship is seven (7) or more short blasts on the ship's whistle and General Alarm, followed by one (1) long blast.



Personal Preparation for Abandoning Ship

Good preparation includes familiarization with the muster list, keeping personal gear ready and knowing what to do in case of emergency. Below are the steps to take in an emergency.

1. Put on warm clothing.
2. Don a lifejacket or immersion suit.
3. Take along a TPA. A TPA reduces the loss of body heat and the risk of hypothermia once you are in the survival craft.
4. Take a big drink of water. Water may become scarce if you are forced to abandon ship. Practice this step in emergency drills so it becomes part of your personal preparedness.

Duties to Passengers

Crewmembers have a responsibility to ensure the safety of the passengers. The muster list specifies duties assigned to specific crewmembers:

- Warn passengers about the emergency.
- Lead them to muster stations.
- Control the flow of human traffic in passageways and stairways.
- Ensure that they are wearing warm clothing and lifejacket.
- Bring blankets to the survival craft.

Crew Duties - Launching Survival Craft

Survival crafts are launched only at the orders of the Master of the ship. All required provisions and equipment should have been loaded prior to launching. You may be asked to put extra food, blankets or batteries in the survival craft if there is still time.

Means of Survival

There are four immediate factors to remember if you need to abandon ship:

- Keep afloat.
- Keep warm.
- Consume food and water.
- Communicate with rescue personnel.



Module 4

Survival Crafts and Rescue Boats

Survival craft and rescue boats provide shelter from the elements, keep you out of the cold water and increase your chances of survival.

Survival craft holds most of the passengers and crew. Rescue boats which are also survival craft, mainly act as a control center for the survival craft operation. They tow and lash together survival crafts and transport injured victims to medical facilities.



Types of Survival Craft

- evacuation system
- lifeboat
- liferaft

The evacuation slide systems are installed on board high-density passenger vessels likely to have a large number of passengers disembarked in an emergency.

Lifeboats and liferafts are crucial in removing passengers and crew off and away from disabled vessels. Once the passengers and crew have boarded the survival craft, the rescue boat tows the lifeboats and rafts to safety and keeps the crafts together.

Lifeboats

Lifeboats have hard hulls and engines. They are usually larger than liferafts. Sometimes lifeboat can act as rescue boat.



Types of Lifeboat

- Open- The open lifeboat has no overhead protection. They are often stored under a canvas, which can be used aboard the open lifeboat as shelter.
- Partially covered- Partially enclosed lifeboats have two permanently attached rigid covers, one at each end of the boat. Each covers 20% of the length of the boat. A permanently attached foldable canopy, totally covers the lifeboat when attached to the rigid covers.
- Self-righting partially covered- These lifeboats have the same rigid cover and canopy arrangement as the partially enclosed lifeboat plus



- totally enclosed lifeboat - It provides better protection against the cold and the sea than does the open lifeboat. It has extra top buoyancy so that it is self-righting. Some models have sprinkler system which provides mist of seawater around it if sailing through burning oil. It should be able to resist the flames up to 8 minutes. Such models are equipped with internal air supply. Totally enclosed lifeboats should comply with the IMO specifications for lifeboats and in addition shall comply with the following:



- access to the lifeboat is provided by a hatches that can be closed to make the lifeboat watertight;
- hatches are positioned so as to allow launching and recovering operations to be performed without any occupant having to leave the enclosure;
- it is possible to row the lifeboat;
- capable, when the lifeboat is in the capsized position with the hatches closed and without significant leakage, of supporting the entire mass of lifeboat, including all equipment, machinery and its full complement of persons;
- it includes windows or translucent panels on both sides and admits sufficient daylight to the inside of the lifeboat with the hatches closed so as to make artificial light unnecessary;
- its exterior is of highly visible color;
- handrails provide secure handhold for persons moving about the exterior of the lifeboat, and aid embarkation and disembarkation;
- people have access to their seats from an entrance without having to climb over thwarts or other obstructions;

- the occupants are protected from the effects of dangerous sub-atmospheric pressures that might be created by the lifeboat engine.

Lifeboat Capacity

For passenger ship, the capacity of the lifeboat is generally sufficient for every person on board. For cargo ship the capacity of lifeboat is generally twice the number of persons on board.

Lifeboat Launching

- davits
- free-fall method

The gravity, or mechanical davit, works even if all power on the ship is lost because it uses the force of gravity to lower the lifeboat to the water. The lifeboat is released by removing a pin from the braking mechanism and allowing gravity to do the rest.

The hydraulic, or stored energy davit, uses hydraulic power, or a motor, to lower the lifeboat to the water. If the ship loses power there is enough stored energy to activate the hydraulics or the motor. After the lifeboat is released, it can be lowered to the embarkation deck and loaded. Then, the lifeboat crew can lower the lifeboat onto the water.

Free-fall Method

If a totally enclosed lifeboat is to be launched by „free-fall“ it is essential that before launching, the coxswain ensure that all doors, ports and ventilators are properly closed and that all the survivors are seated with their safety belts correctly and tightly adjusted. He should ensure that is clear below and give ample warning that he is about to let go the boat fall and allow sufficient time for unready survivor to object, before actually launching the boat.

Safe Launching of Lifeboat

In order to safely launch lifeboat, you must check three main areas for obstructions (people, debris or parts of the ship).

- The launch area on board the ship.
Check the launch area for passenger and crew for any obstructions
- The side of the ship.
Check that the lifeboat will not hit anything on the way down such as the vessel's side if the ship is listing.

The Drop Zone

Check the drop zone, where the lifeboat will land to make sure the area is clear of danger, people and obstructions.

Lifeboat Embarkation

Embarkation means boarding a lifeboat from a disabled vessel. In order to get ready to leave the vessel, passengers must gather first at their muster stations, then at the embarkation stations. On passenger ships, assigned crew board the lifeboats in their stowed positions. Other crew and passengers board from the embarkation deck.

Embarkation consists of two phases: boarding the lifeboat, and launching the lifeboat. There are four methods of embarkation:

- boarding directly from the vessel deck to a lifeboat on the water;
- boarding a lifeboat from the deck and being lowered by davits to the water;
- entering the water to board a lifeboat; and
- climbing down a ladder or sliding down a chute to reach a lifeboat.

Liferaft

They are not motorized and are usually smaller than lifeboats. Liferafts are also easier and faster to launch than lifeboats which is critical during a crisis when quick action is needed.

Inflatable Liferaft

The main buoyancy chamber is divided into not less than two separate compartments, each inflated through a non return inflation valve on each compartment. The buoyancy chambers are arranged that in the event of any one of the compartments being damaged or failing to inflate, the intact compartments will still support, with positive freeboard over the liferaft's entire periphery, the number of persons which the liferaft is permitted to accommodate. The floor of the liferaft is waterproof and capable of insulating the occupants against cold by means of one or more compartments that the occupants can inflate or which inflate automatically and can be deflated and re-inflated by the occupants.

Inflatable liferaft can be inflated by one person. It is inflated by a non-toxic gas and is fully inflated after 1 minute period. It has a relief valve which will release excess gas when the working pressure is exceeded.

Rigid liferaft may be entirely rigid or have rigid hulls with inflatable sides. They should not be confused with rescue boats, some of which are also partially inflatable. Rigid liferafts usually don't offer as much protection as lifeboats or inflatable liferafts and are no longer commonly used, so your ship probably does not have them.

Liferaft Launching Methods

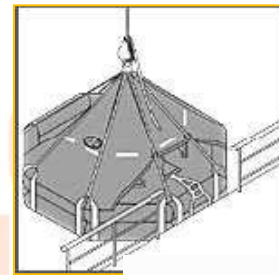
Float-free Launching

This method of launching a liferaft causes inflatable liferafts to automatically launch by themselves if the ship sinks. The hydrostatic release system is an automatic launching mechanism that requires no human contact. This system is activated by water pressure.

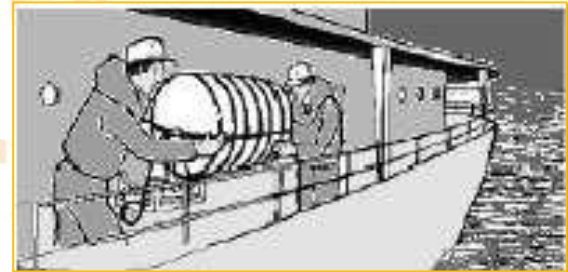


When the ship sinks, the increasing water pressure releases the liferaft canister from its cradle. The canister rises to the surface of the sea. As the liferaft canister floats up from the sinking ship, it pays out the liferaft's painter line which links the raft to the ship. When the line becomes taut, it opens the canister and triggers the raft's carbon dioxide cartridge to inflate the raft.

The davit-launched liferaft is to be connected to the davit and then inflated at deck level thus, enabling the passengers to board the raft from deck. The raft is then launched to the water. All approved liferafts must be equipped with an automatic release gear (hydrostatic release unit) which makes release the raft automatically under water if no time is left for manual release.



The throw-overboard liferaft is released from the cradle and thrown overboard or slides automatically when released. When waterborne, the liferaft inflates on a hard pull of the painter line and is then ready for boarding.

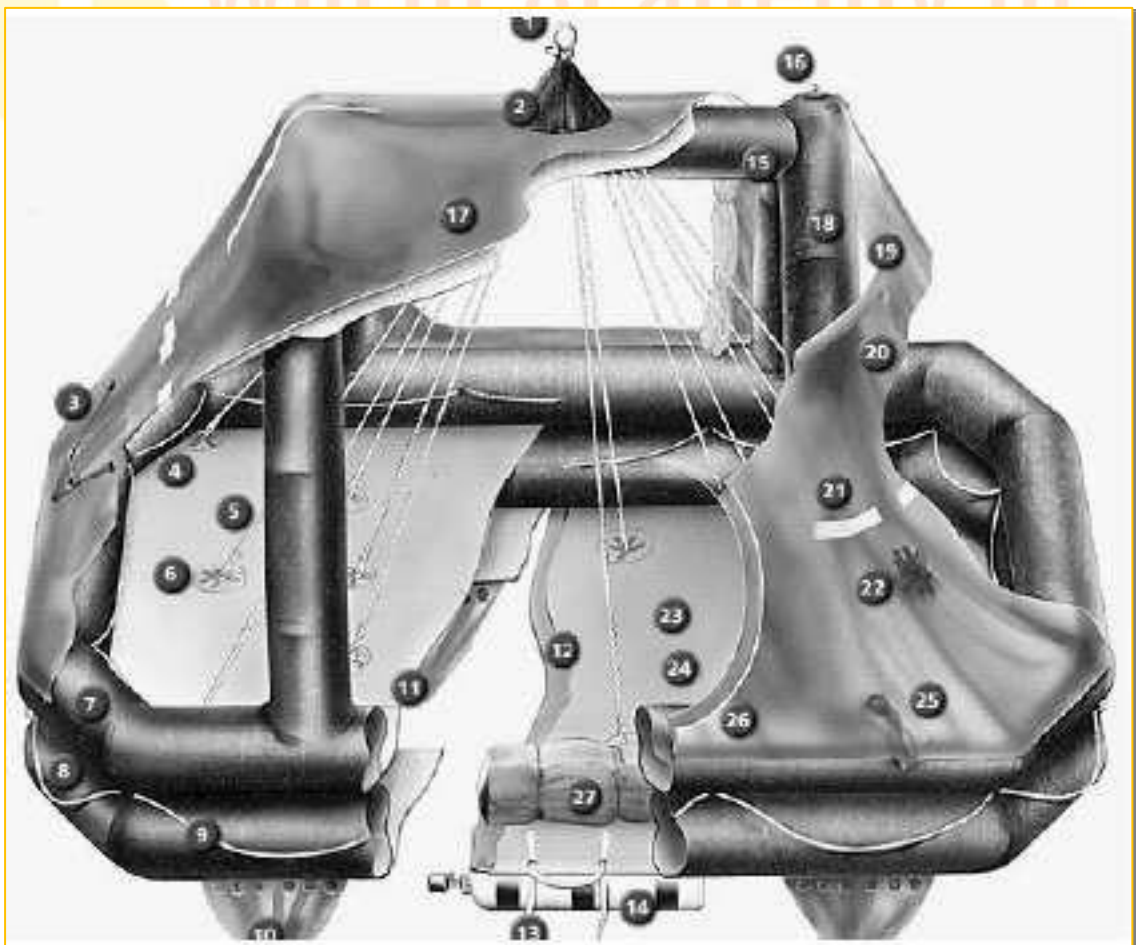


In combination with the evacuation system, the liferafts are remotely released. When waterborne, the liferaft container is connected to the inflated evacuation system. The liferaft inflates on a hard pull of the quick release line and is then ready for boarding.

1. shackle
2. lifting arrangement/suspension straps
3. rainwater catchment and collecting unit; rainwater collecting bags and operational instructions inside
4. internal grab line
5. suspension strap
6. patch for lifting arrangement
7. upper buoyancy tube
8. lower buoyancy tube
9. external grab line

1.19 PERSONAL SURVIVAL TECHNIQUES A-VI/I-1

10. stabilizing pockets
11. floor in middle
12. floor at bottom
13. boarding ladder
14. CO2 cylinder
15. arch tube external, automatically activated light
16. external, automatically activated light
17. internal, automatically activated light
18. arch tube
19. inner canopy
20. outer canopy
21. retro-reflective tape
22. viewing port
23. double floor
24. bilge arrangement
25. Drain
26. double zip closure
27. emergency pack



Rescue Boat

Rescue boats serve as a command center for survival craft once they are in the water. Crew in rescue boat can direct operations during a ship evacuation. When a ship is evacuated, the main job of rescue boat is to tow lifeboats and liferafts to safety and tie them together. This increases the chances of being seen and improves the morale of survivors. Rescue boat also rescue people from the water and can serve as survival craft. During normal ship operation, they can transport ill or injured passengers to medical facilities on shore or help a nearby boat in distress.

SOLAS Requirements for Rescue Boat

- Passenger ships of 500 tons gross tonnage and over shall carry at least one rescue boat on each side of the ship.
- Passenger ships of less than 500 tons gross tonnage shall carry one rescue boat.
- Cargo ships shall carry at least one rescue boat.
- Lifeboats can be used as rescue boats, provided they meet all the additional requirements :
 - towing ability and equipment (boat hook and towing line);
 - the ability to be ready for immediate use;
 - the ability to be lowered and recovered fully loaded;
 - an inboard or outboard engine capable of 6 knots for 4 hours.



Module 5

Personal Life-Saving Appliances

Personal life-saving appliances are made to keep you warm and afloat both in the water and on survival craft. The following are the four major life-saving appliances.

1. Lifebuoy

Lifebuoys are made from buoyant material and do not require inflation. They float and can support the weight of a person in the water. Lifebuoys are so distributed as to be readily available on both sides of the ship and as far as practicable on all open decks extending to the ship's side; at least one shall be placed in the vicinity of the stern.



They are stowed as to be capable of being rapidly cast loose and do not permanently secured in any way. It has a line of at least 15 fathoms (27 m) in length.

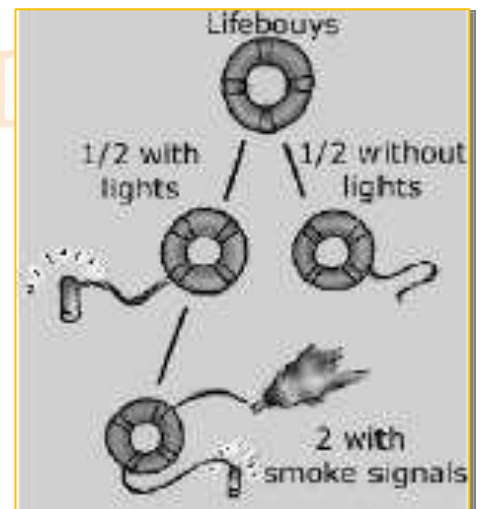
Equipment attached to lifebuoy:

self - igniting light

- cannot be extinguished by water;
- capable of either burning continuously with a luminous intensity of not less than 2 cd in all direction of the upper hemisphere or flashing at a rate of not less than 50 flashes per minute with at least the corresponding effective luminous intensity;
- source of energy for a period of at least two hours

self - activating smoke signals

- emit smoke of a highly visible color at a uniform rate for a period of at least 15 minutes when floating in calm water;
- not ignite explosively or emit any flame during the entire smoke emission time of the signal;
- would not be swamped in a sea-way;
- continuously emit smoke even when fully submerged in water for a period of at least 10 seconds



buoyant lifelines

- have a diameter of not less than 8 mm (one inch rope);
- have a breaking strength of not less than 5 kilo Newton

2. Immersion Suit

Immersion suits keep the wearer warm and dry. They are protective waterproof suits that conserve body heat while allowing mobility to the wearer. Insulated immersion suits keep the wearer warm while non-insulated suits need warm clothes underneath.

Immersion suits are worn by rescue boat crew for protection. It allows them freedom of movements while performing their duties. They can jump into the water without causing damage to the suit or having water enter the suit.

The immersion suit covers the whole body except the face. Some are designed to wear without a lifejacket. These suits are outfitted with a light so they can be spotted at night. At least three immersion suits are required on ships having open or partially open lifeboats.



3. Lifejacket

Type: Solid lifejacket in three sections
 Color: Orange
 Cover: PU coated polyester
 Buoyancy: Inherent buoyancy: 135 N
 Weight: Approx. 0.75 kg.
 Retro-reflective trim: fitted with 400 cm² retro-reflective trim
 Miscellaneous: Light can be recessed for flush fitting. Provided with whistle



Type: Fully automatic jacket
 Buoyancy: 160 N
 Weight: 1.20 kg.
 Buoyancy chamber: PU-coated nylon. Double-compartment buoyancy chamber (via membrane)
 Inflation: The primary compartment may be automatically, manually or orally inflated. The secondary compartment may be orally and manually inflated.
 CO2 cylinder: 2 pcs. of 38 g. CO2 cylinder
 Retro-reflective trim: fitted with retro-reflective trim
 Miscellaneous: Fitted with whistle, lifting becket, emergency light and a spray cap around CO2 cylinder to prevent unintended inflation due to moisture



4. Thermal Protective Aid (TPA)

Designed to keep survivors warm and protected against rain, wind and cold in liferafts and lifeboats. Thermal protective aid or TPA will help to keep a survivor warm by preserving body heat. All the outer edges are sealed (heat welded) not sewn which makes the bag watertight up to the zip. So even in a partly filled liferafts or lifeboat you will have dry feet. The inside layer is metallized to retain body heat and the material used has thermal conductivity of 0.1 W.

Thermal protective aid is made of strong material (blaze orange polyethylene) that will support an unconscious person being carried. It has a long zip for donning and will accommodate a mother and small child.

A lifejacket should always be worn with a thermal protective aid.



Personal Survival Without Lifejacket

During practice, you will be required to demonstrate how you will keep yourself afloat without a lifejacket. This activity will prepare you for emergency situation wherein you do not have the time to wear a lifejacket and have to jump immediately into the water.

Learning how to float is a must if you want to increase your chance of survival because floating is effortless thus, conserves energy. To achieve perfect floating, the following procedures should be practiced:

- go to a body of water where the depth is up to your lower rib;
- take in air, hold your breath and float in face-up position;
- do the above procedures repeatedly until you have perfect it.

Boarding Liferaft From the Ship

It is easy to board liferaft when one is at the embarkation deck. However, it is another story when the liferaft is already in the water. Here are ways how to board liferaft safely:

- a. by means of a ladder;
- b. by means of evacuation slide;
- c. by jumping into the liferaft from a height not higher than 2 meters;
- d. by jumping first into the water (last resort)



Liferaft Equipment

A normal liferaft will have the following equipment packed inside:

- A. Floating Anchor
- B. Pump
- C. Watertight bags
- D. Thermal Protective Blanket
- E. Paddles
- F. Rescue quoit with line
- G. Bailer
- H. Sponge
- I. repair Kit
- J. Checkbook and liferaft instructions manual
- K. Survival instructions and signal card
- L. Survival Manual



Raft equipment



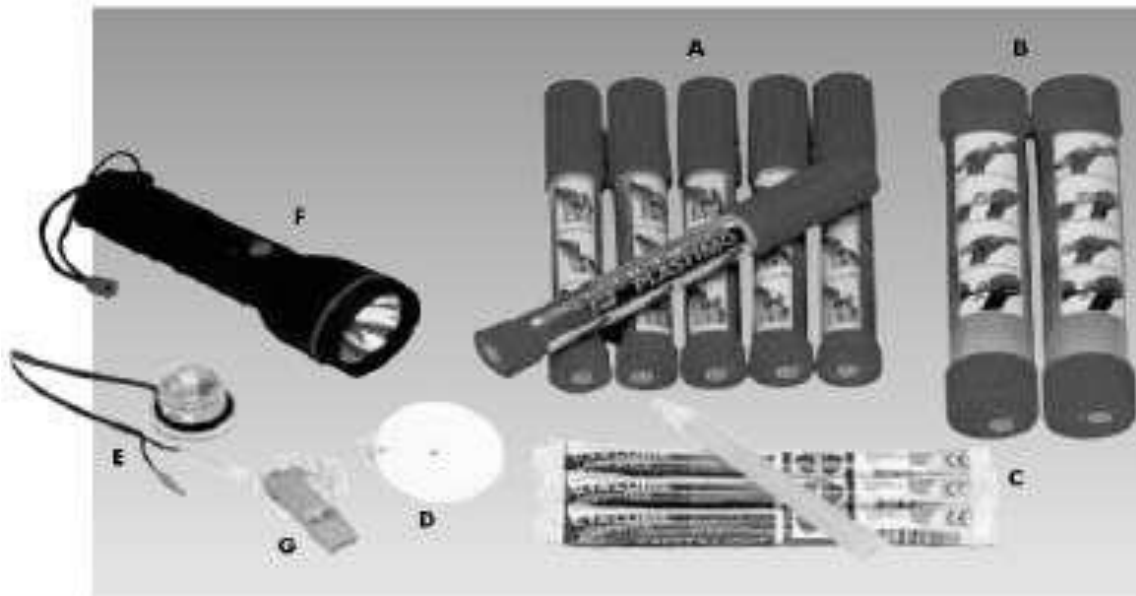
Personal survival



A. Raincatching gutter on canopy.

Personal Survival

- A. Raincatching gutter on canopy
- B. Rainwater collecting pouch
- C. Water
- D. Graduated Cup
- E. Food Rations
- F. Fishing Kit
- G. First Aid kit
- H. Seasickness pills



Signalling equipment

- A. Handflares
- B. Parachute rockets
- C. Chemical Light sticks
- D. Signalling mirror
- E. Lithium lamp on top of canopy
- F. Waterproof torch
- G. Whistle

SART (Search and Rescue Transponder)

produces an instantly recognizable „12 dot“ radar return to direct searching from aircraft or passing vessels



Righting a Capsized Liferaft

- Climb up and step on the CO2 cylinder facing the wind.
- Hold the righting strap.
- Lean backward and pull the righting strap.
- When the liferaft is about vertical, keep clear from underneath.
- Swim underneath liferaft and board the liferaft.

How to Disembark from the Liferaft

- With lifejacket on, sit on the chamber at entrance facing inside raft.
- Block-off nose and mouth with one hand and the other holding the shoulder.
- Clip lifejacket firmly against your body.
- Lean forward to gain momentum and lean back to disembark.

Module 6

Survival at Sea

Dangers to Survivor

After abandoning ship, the greatest dangers you may face are:

- heat exposure
- exposure to cold and hypothermia
- effects of seasickness
- failure to maintain body fluids correctly causing dehydration
- drinking seawater
- fire or oil on water
- Sharks

Heat exposure or hyperthermia is caused by over-exertion or over-exposure to heat or sun. The most common types of heat exposure illness are heat stroke, heat exhaustion and sunstroke. Heat stroke is the most serious and can lead to death. Prevent heat exposure illnesses by drinking fresh water, staying in the shade and resting. Also keep the craft's canopy wet and wear wet clothing since evaporation of the water is cooling.

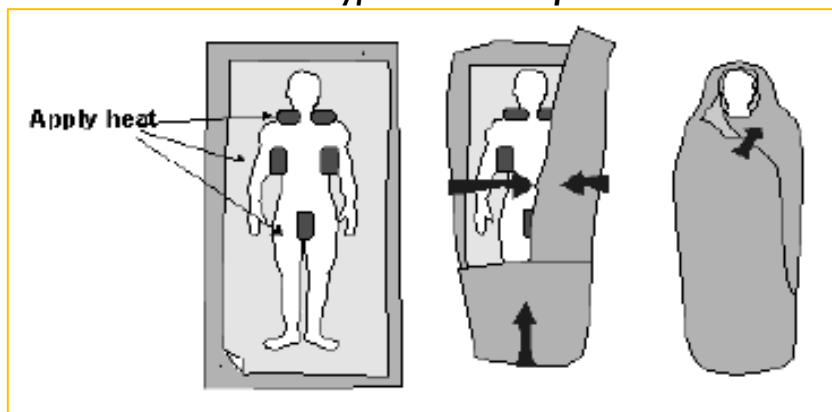
Hypothermia

Occurs when your body loses more heat than it creates and your body temperature reaches 95 degrees Fahrenheit or less. Most body heat is lost through the head and neck but also through the armpit and groin.

To prevent hypothermia:

- wear warm clothing (wool or synthetic clothing);
- wear three or more layers of clothing;
- keep dry (stay out of the water);
- insulate the floor of liferaft against cold; and
- keep liferaft entrances closed.

Hypothermia Wrap



Seasickness is caused by the rolling and pitching of the liferaft especially during foul weather. This will lead to vomiting, dizziness and eventually dehydration. Take anti-seasickness tablet immediately after boarding survival craft or better if taken while still in the ship.

Dehydration

Failure to maintain body fluids correctly would cause dehydration. Dehydration is caused by excessive urination, vomiting and diarrhea. Symptoms of dehydration include increasing thirst, headache, sleepiness and reduced or dark urine. To prevent dehydration:

- drink fresh water, never your urine or seawater;
- don't drink alcohol or sweet drinks;
- don't eat if water is not available;
- avoid unnecessary movements; and
- ventilate liferaft

Drinking Seawater

Do not drink it otherwise, you will feel thirstier and more likely to die. Seawater only uses your water reserves to neutralize the seawater's salt causing rapid dehydration

Shark

Despite their reputation shark rarely attack people. However, if they are in your area, avoid attracting them. Sharks are attracted to blood and body wastes, shiny objects, movement and irregular noise (splashing and screaming). Limit your disposal of any type of waste and throw it as far from the craft as possible. Also stay out of the water and do not suspend your arms and legs in the water.



Fire or Oil in Water

When launching lifeboat in water covered with burning oil, the coxswain (boat leader) should activate the water spray system of the lifeboat to insulate it from flames. Ventilators should all be closed and never opened until the boat is clear of oil and fire in the water. Quickly move the craft to safety heading against the wind. Wipe off oil or fuel that gets on your craft to reduce the fire risk. Do not allow lit matches or smoking on the craft.

If you find yourself in a situation wherein no other action but to jump straight into the water covered in oil or flames, you have to remove the lifejacket you are wearing because you will have to swim underwater to get away from that stricken area. Swim underwater to safety. If you run out of reserve air and need to go up, use your arms to sweep away oil and flames.



Best Use of Survival Craft Facilities

A survival craft must be immediately cleared away from the stricken ship. To move the craft safely, the equipment in the survival craft have to be used. Motors or paddle a rescue boat to tow the craft. Throw the sea anchor to hasten the movement of the craft away from the danger area. Moving the craft to a safe distance keeps the craft away from possible fires, explosions or oil spills and prevents the craft from being bumped or swamped by the ship or hit by debris.

Sea Anchor

To slow drift and stabilize the craft or ease the steering, sea anchor is used. This is necessary when the survival craft is already on a safe distance from the ship. The craft should be maintained near the area of incident in order to be rescued. It is a parachute-like device made of canvas, usually color orange. Position the sea anchor behind the craft. It should trail in the trough of waves as the craft rides the crest. Keep the anchor line tight.



What to do while waiting for the rescuers

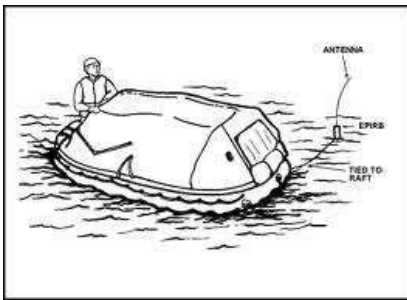
After the survival craft has been safely moved away from the danger area and the sea anchor is holding the craft, survivors on the craft should do the following measures to enhance survival:

- immediately establish boat organization (the highest person in terms of position should take the command);

1.19 PERSONAL SURVIVAL TECHNIQUES A-VI/I-1

- assign tasks such as lookouts, care of signals, radio operator, rationing and supplies, maintenance of the survival craft and medical care;
- install protective covers, insulate the floor from cold, wet clothes be removed and dried and have thermal protective aid be used;
- distribute blankets and anti-seasickness tablets;
- give medical attention to those injured;
- rig detection devices;
- search for other survivors; and
- gather other survival crafts.

Duties of a Lookout



A lookout is man who searches for ships, floating objects, rescuers, land, rocks and sea life. Lookout checks the craft for leaks and wear and tear. Lookout also watches over sleepers to ensure they stay warm and safe. He should keep a log to record everything that happened during his watch.

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Means of Facilitating Detection

To facilitate detection, survivors have to use long-range signaling equipment as well as short-range signaling equipment. Either will provide fast rescue.

Long-range Signaling Equipment

- radio equipment
- Emergency Positioning Indicating Radio Beacon (EPIRB)



Short-range Signaling Equipment

- rocket parachute flare
- contained in a water-resistant casing
- have instructions on how to use it
- have integral means of ignition
- burns with a bright red color
- luminous intensity of 30,000 cd
- burning period of at least 40 seconds
- rate of descent not more than 5 meters



Buoyant Smoke Signal

- contained in a water-resistant casing
- have instructions on how to use it
- emits highly visible color for 3 minutes
- will not emit flame during emission
- not be swamped in a seaway
- continue to emit smoke even submerged in water for 10 seconds



Hand Flares

- contained in a water-resistant casing
- have instructions on how to use it
- have integral means of ignition
- burns with a bright red color
- luminous intensity of 15,000 candles
- burning period of at least 60 seconds



1.19 PERSONAL SURVIVAL TECHNIQUES A-VI/I-1

- continue to burn even immersed for 10 seconds under 100 millimeter of water

Maintaining Morale

It is but natural that after shipwreck, a feeling of depression, hopelessness and helplessness would be felt. However, these moods are not permanent or unchangeable. These emotions can be altered by doing something that will boost up survivors' morale. The leader whom can be you should do the following:

- talk to everyone;
- encourage everyone to help each other;
- keep them busy by delegating work and organizing schedules;
- make sure everyone gets lots of sleep and rest; and
- encourage mild exercise, games, stories, jokes, songs and prayer



Survival When in Water

Always wear your lifejacket while in survival craft because you will never know when you could end up in water. If you do fall into the water, use the H.E.L.P (Heat Escape Lessening Posture) shown in the figure to conserve body temperature. Water can be a lot colder than you can imagine. In the water, the body loses heat at least 25 times faster than it does in the air.

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Module 7

Emergency Radio Equipment

Emergency radio equipment if used can help save lives and hasten rescue. These communication devices are found in the bridge and also inside the survival craft.

Two-way Radio (VHF) for Survival Craft Those radios are designed to be used in an

emergency even by an unskilled person. Tough waterproof design, floats, fitted with channel 6, 13, & 16 and equipped with non-rechargeable lithium battery pack. Two-way radios are portable and can be used for onboard communication.



Channel 16 is used only during an emergency. Drills, practices and onboard communications are conducted on Channel 6. Keep unnecessary conversation to a minimum so that all incoming and outgoing messages are clear.

Emergency Position-Indicating Radio Beacon (EPIRB)

The main purpose of an EPIRB is to act as a location device whose distress signals can be picked up by any aircraft or vessel passing the area. EPIRBs are easily accessible on the bridge and weather deck and can be manually released from this position so they can be carried onto survival craft.



When activated, EPIRB sends out distress signals on a worldwide satellite network which is received by ground receiving station. The distress signal is then passed to rescue coordinating center (RCC) which then alerts aircraft and vessel near the area. EPIRB sends a continuous radio transmission which acts as a homing beacon for responding rescuers.

Most ships carry three EPIRBs. One is placed at the communication deck which is equipped with HRU or hydraulic releasing unit for automatic means of release in case the ship sinks. The other two EPIRBs are mounted on the railing of the bridge wings which can be manually released.

Mounted on brackets, EPIRB is switched to auto modes which ready the unit to emit distress signals once the EPIRB is released from the mounting bracket. A button that is kept pressed by the bracket prevents the EPIRB from emitting signals (406.025 MHz - alert frequency; 121.5 MHz - homing frequency). But if released, either manually or by the buoyancy force to HRU, EPIRBs will continuously emit alert and homing signals. In the event of fire, collision or being adrift, EPIRBs have to be manually switched to „Fire“, „Collision“ or „Adrift“ position.

Satellite EPIRBs are for fast rescue of those who are stricken at sea. Be extra careful not to accidentally activate EPIRB. Thousands of lives depend on it. Before removing EPIRB from the mounting bracket, rotate first the switch to „OFF“ position.

Search and Rescue Transponder (SART)

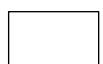
Radar transponder emits a signal that allows the ship's radar to see your survival craft.

A 9 GHz radar transponder emits a signal that a vessel can pick up on its radar. The signal appears as a series of „12 dot“ radar return to direct searching from aircraft or passing vessels. The 9 GHz transponder is only good for distances less than ten miles. All ship carry two 9 GHz radar transponders one on each side of the hull (normally at the bridge wing). Transponders are carried onto the survival craft just like other emergency communication equipment.



To Activate the SART in an Emergency

1. Release the SART from the mounting bracket. Make your way to the liferaft.
2. Pull down firmly the red activation clip to turn the SART „ON“. The LED will flash slowly. When in range of a radar signal, the LED will flash rapidly.
3. Pass one end of the black hanging strap over the top of the support tube and tie the strap to allow the SART to hang in the center of the craft.



Module 8

Helicopter Assistance

Communicating with the Helicopter

1. Hand and arm signals are fastest and most easily understood.

“DO NOT HOIST, NOT READY” -
arms extended horizontally, fingers
clenched, thumbs down.

“HOIST” - arms extended horizontally,
fingers clenched, thumbs up



2. communicating with the helicopter through a shore station

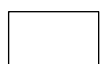
Helicopters used in search-and-rescue operations are fitted with UHF and VHF communications equipment, M/F radio and normally UHF homing equipment.

A GMDSS-trained operator handles communication between a helicopter and a ship through a shore station. However, the equipment carried onboard and the communication can vary. In Sea Area 1 and 2, communication is through VHF radio or MF or HF radio if available. In Sea Area 3, communication is conducted by an INMARSAT satellite through a remote earth station or by MH radio if it is within range of a shore station. In all cases, the GMDSS operator will conduct the communications between the ship and helicopter.

Evacuation From Ship and Survival Craft

Here are safety measures that should be observed during evacuation from ship and from a survival craft:

- Do not touch the rescue device until it discharges static electricity; let the device touch the deck or the water first, instead use the rope tail line to guide the rescue device to the deck. This line does not conduct static electricity and can be safely touched.
- Never hood the rescue device to the ship or survival craft. Leave the rescue device and its cable free while you prepare.





Pick-up Space

Pick-up space should be at the stern, in an area clear of mast, rigging and all other obstructions so that a helicopter may land. If this is impossible, the helicopter will hover next to the ship and lift people instead.

Evacuation from a Ship

When you evacuate from a ship by helicopter:

1. Let the rescue device touch the ship's deck to discharge static electricity.
2. Don the rescue device or help injured people into the basket or stretcher.
3. Cross your arms and give the thumbs-up signal.

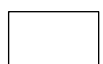


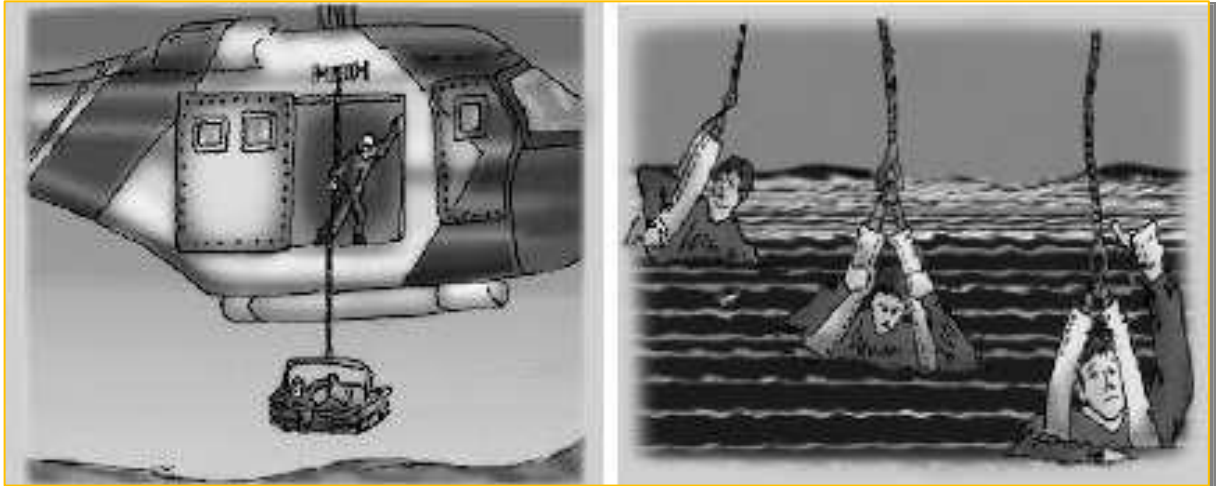
Rescue Devices

A harness or strap is a wide band of material attached to a yoke and cable. The harness fits around your back and under your armpits. Cross your arms in front of you and grab the harness.

A basket looks like a small cage, except that one side is open. Crawl inside and sit down, holding onto the sides for stability. A stretcher lifts survivors lying down. This is excellent for anyone with injuries or hypothermia.

Hydrostatic pressure is water pressure on a survivor's body, which slows down circulation. Lifting a survivor out of the water releases this pressure quickly and can cause shock, possibly leading to heart failure. People who have hypothermia, or who have been in the water for a long time, should be transported by stretcher or basket to ease the shock. The horizontal position lowers the chance of survivors going into shock due to release of hydrostatic pressure.





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