



Food and Agriculture  
Organization of the  
United Nations

# Safety at sea for small-scale fishers







# **Safety at sea for small-scale fishers**

**Food and Agriculture Organization of the United Nations**  
Rome, 2021

Required citation:

FAO. 2021. *Safety at sea for small-scale fishers*. Rome.

Revised, May 2021.

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ISBN 978-92-5-131753-2

First edition: 2019

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## Preface

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“Safety First” is what anyone working on a fishing vessel should keep in mind. Safety must be given top priority. Proper safety measures will save lives, protect vessels from damage, prevent serious accidents and injuries, protect the environment, and contribute to profitable fisheries.

The owners, operators and skippers of all fishing vessels have a responsibility to train their crew on safety. This manual provides examples of accidents that may occur onboard fishing vessels and useful tips to prevent such accidents from happening.

This manual has been made primarily for small-scale fishers who use vessels of less than 12 metres in length. However, most of the tips are also useful for bigger fishing vessels up to 20 metres in length.

It is written and illustrated in a simple way to promote a culture of safety awareness.

## Acknowledgements

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This Manual on “Safety at sea for small-scale fishers” was prepared by the Food and Agriculture Organization (FAO) of the United Nations in close collaboration with the Bay of Bengal Programme Inter-governmental Organisation (BOBP-IGO).

The current document is an updated version of a manual produced as part of the Tsunami Rehabilitation Programme in 2007, which was supported by the Government of Italy. The original document was developed by Mr S. K. S. Jayasinghe, Mr Lalith Senanayake, Mr Ari Gudmundsson and Mr Stefano Thermes. This updated version of the Manual was prepared by Mr S Jayaraj and Mr Yugraj Singh Yadava (BOBP-IGO) with technical guidance from Mr Raymon van Anrooy, Ms Iris Monnereau and Ms Nicole Franz (FAO).

This Manual has been prepared in support of the implementation of the "Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries" in the Context of Food Security and Poverty Eradication (SSF Guidelines). The production of this document was facilitated by a contribution from the Government of Norway to the FAO Umbrella Programme for the Promotion and Application of the SSF Guidelines, and the Global Environment Facility (GEF) financed "Climate Change Adaptation in the Eastern Caribbean Fisheries Sector project (CC4Fish)."

## General safety



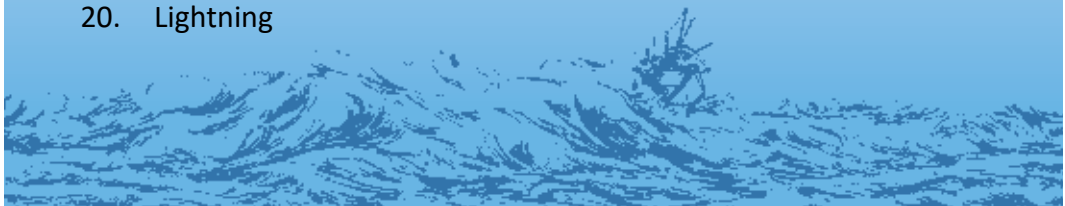


## General safety

The space available onboard a small-scale fishing vessel is very limited. Many tools, equipment and gears that are needed for fishing operations are stored onboard. Supplies such as ice, bait, freshwater, fuel and food needed to successfully complete the fishing trip are also stored onboard. Sometimes there is hardly enough space to cook and accommodate the crew. Sufficient working and living space is important for safety of the crew. Maintenance of the vessel is also an important factor of safety. Regular checking of the steering and fuel systems, navigational equipment, the hull and engine operations, as well as safety equipment is essential for safety.

Be aware: The main causes of accidents on fishing vessels are the following:

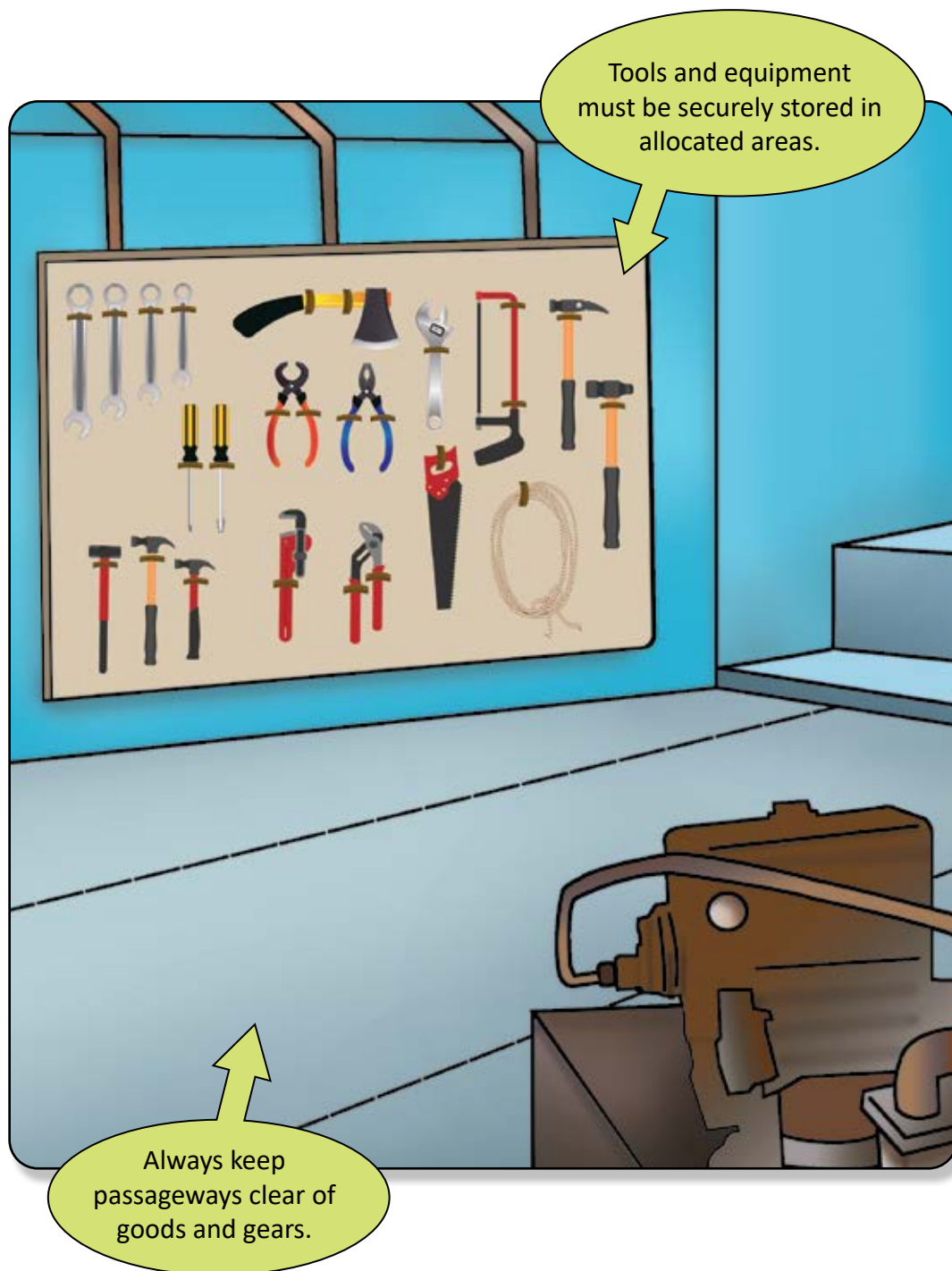
1. Fire onboard
2. Man falling overboard
3. Personal accidents harming the crew
4. Water leaks in the hull
5. Loss of position and become stranded
6. Loss of fishing gear
7. Engine failure
8. Loss of steering system
9. Loss of propeller
10. Breakdown in the gear box.
11. Short of fuel
12. A cyclone
13. Short of drinking water and provisions
14. Collision with another vessel
15. Loss of communication
16. Falling in the hands of pirates
17. Run aground
18. Explosions
19. Strong winds and currents
20. Lightning



## Deck safety





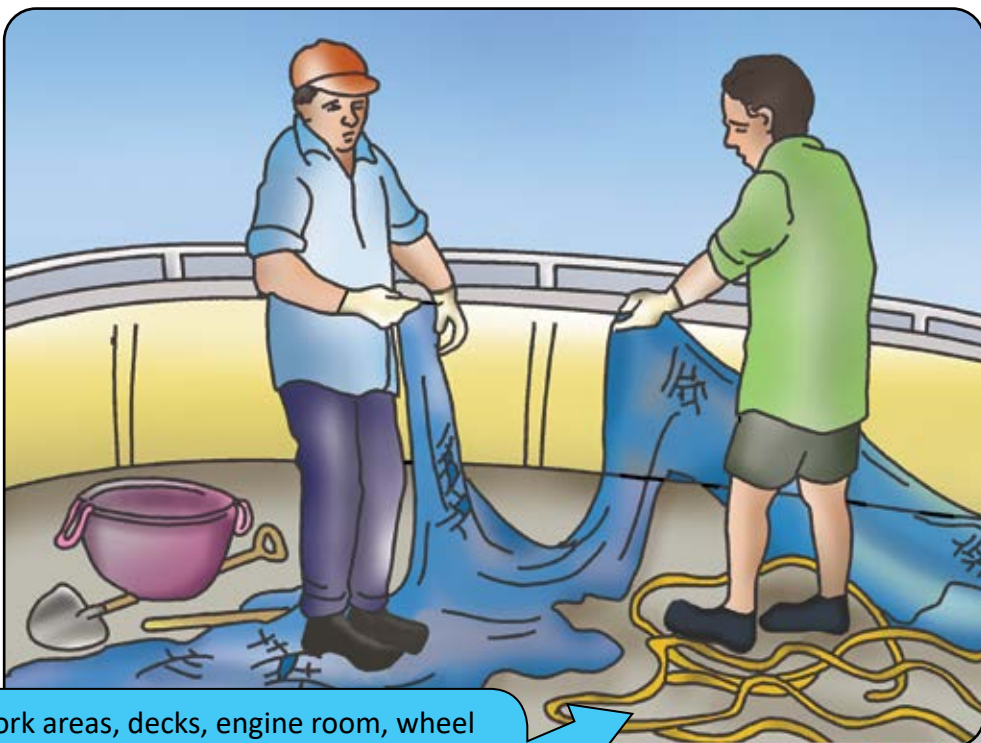




Always keep a wire cutter and a knife ready to cut lines or gear that is tangled or needs to be cut away. This will also allow separating a person if entangled in net or rope or caught by hooks.



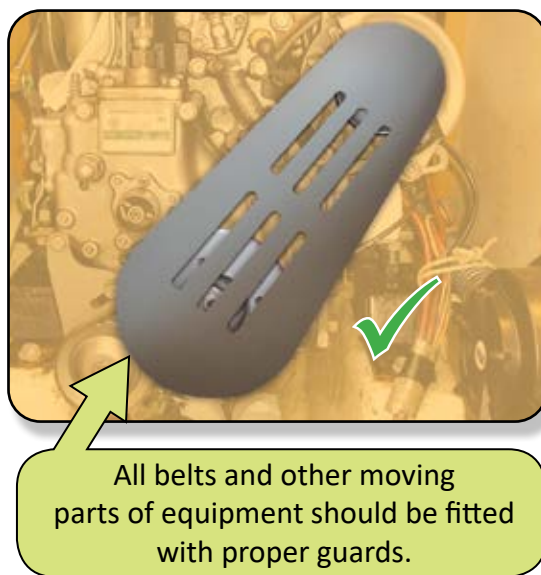
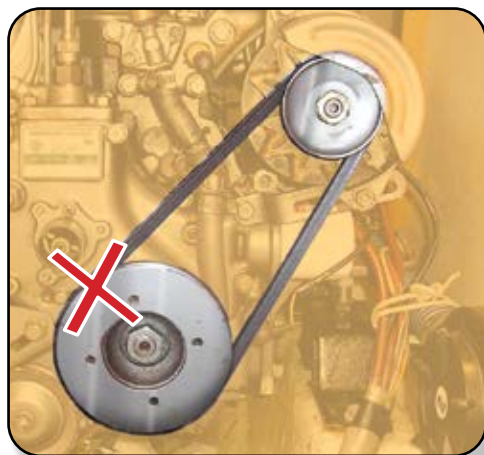
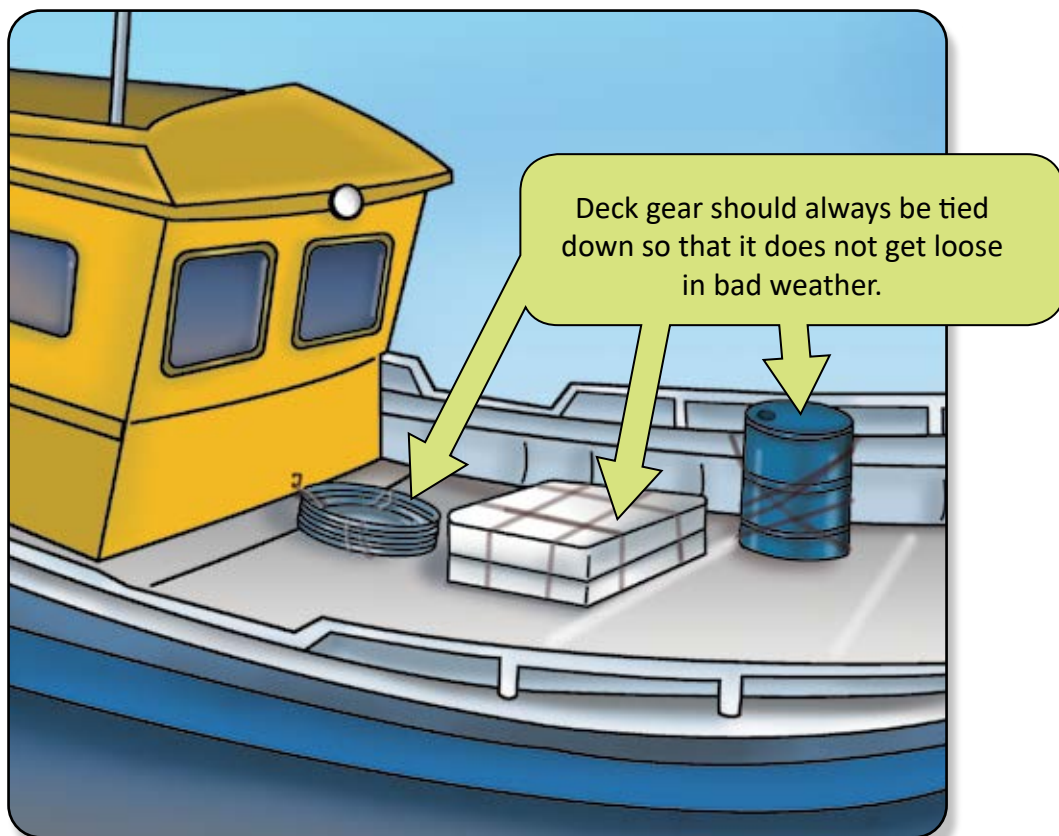
Do not use gasoline or other liquids that can catch fire as a cleaning agent.



Work areas, decks, engine room, wheel house and the anchor area must be kept free of elements that can cause a person to slip or trip.



Decks must have non-skid surfaces, except where a smooth surface is needed for handling fish.

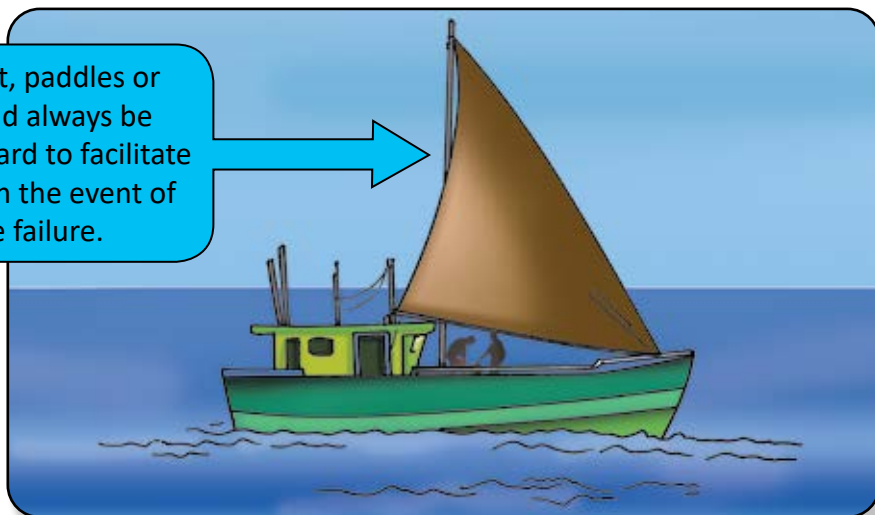


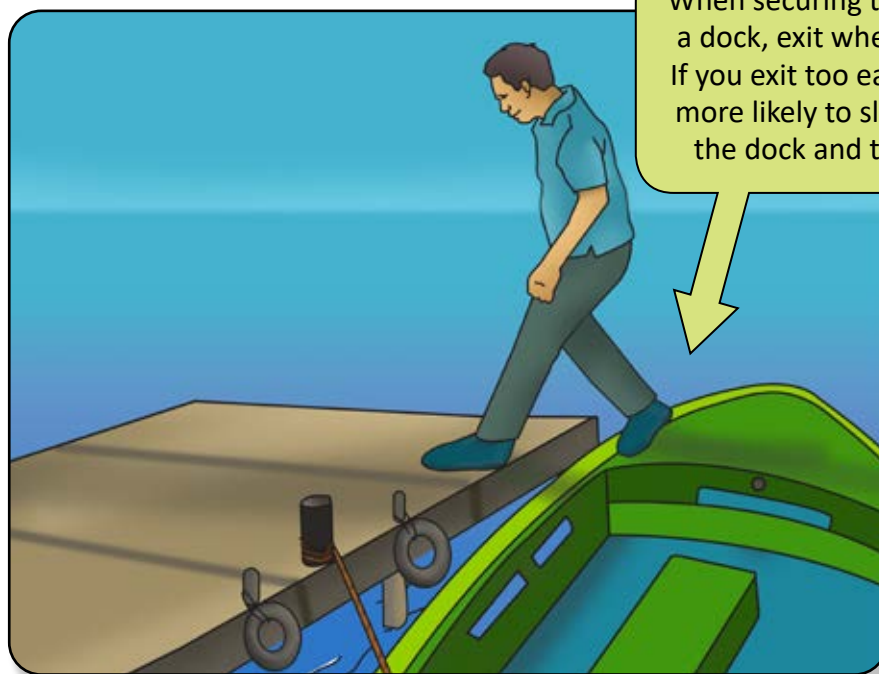




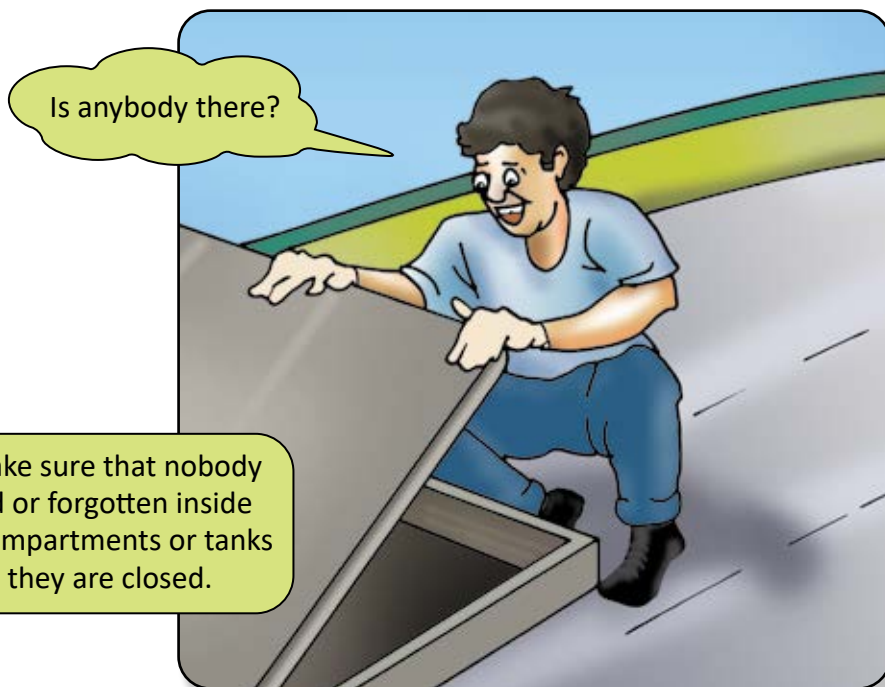
No sharp edges should be kept exposed in working and sleeping and other areas where the crew is active.

A sail, mast, paddles or oars should always be carried onboard to facilitate navigation in the event of engine failure.





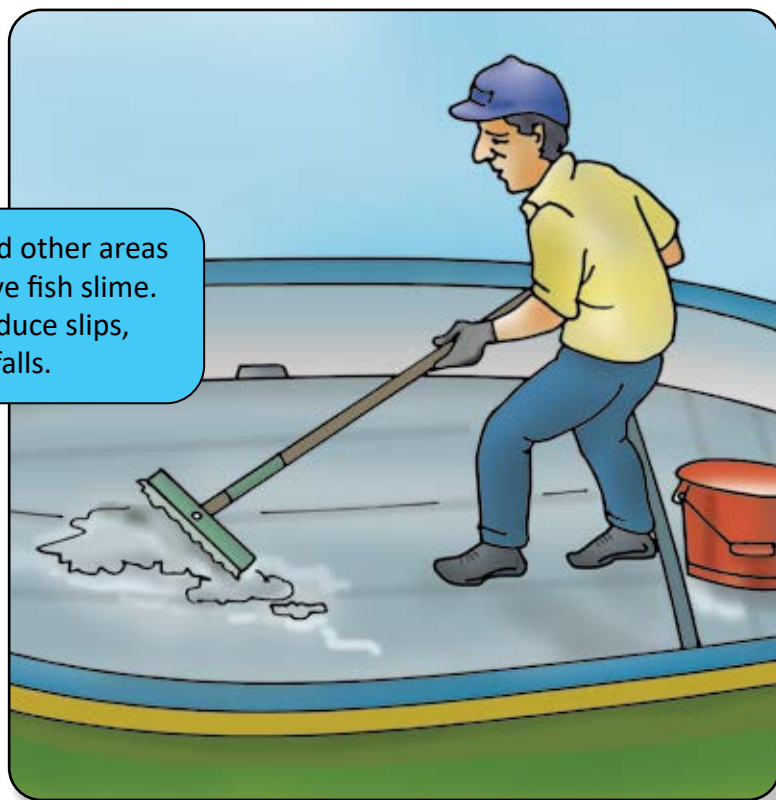
When securing the vessel to a dock, exit when it is safe. If you exit too early, you are more likely to slip between the dock and the vessel.



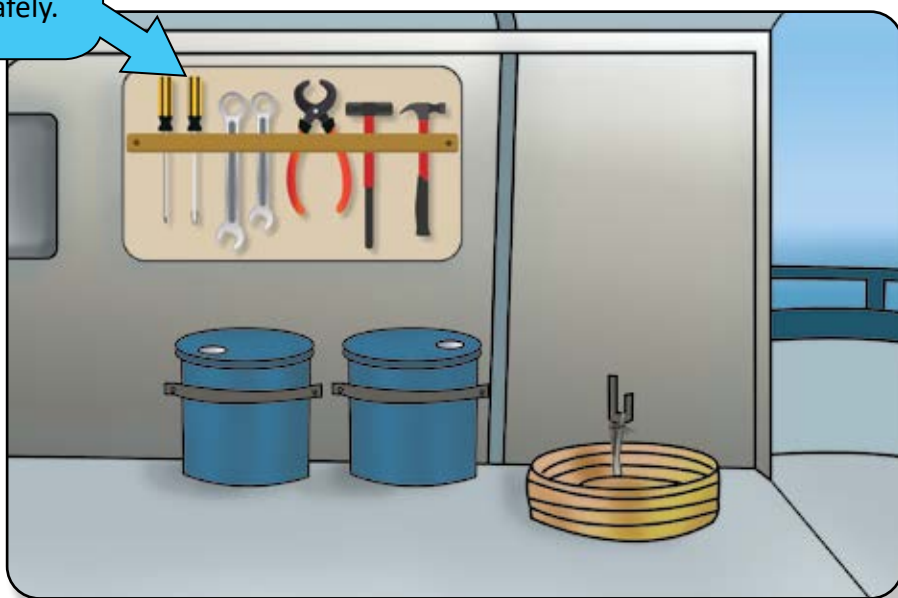
Is anybody there?

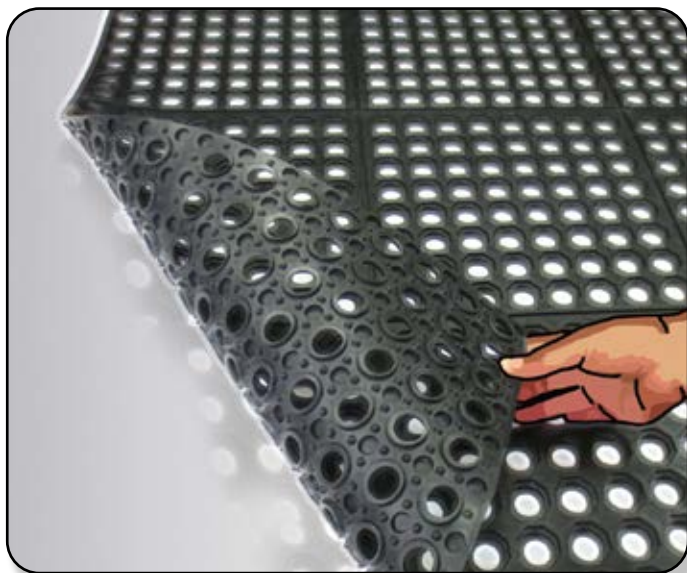
Always make sure that nobody is trapped or forgotten inside hatches, compartments or tanks before they are closed.

Wash the decks and other areas regularly to remove fish slime. This will help reduce slips, trips and falls.



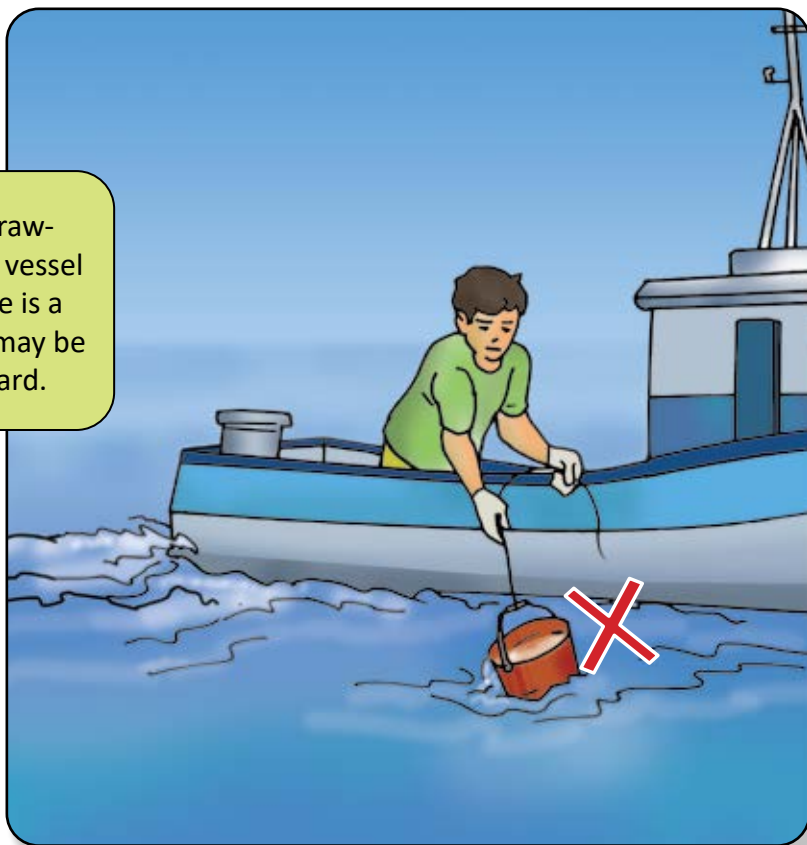
Organize and store all gear safely.





Where practicable, use mats on the deck to provide a good foothold.

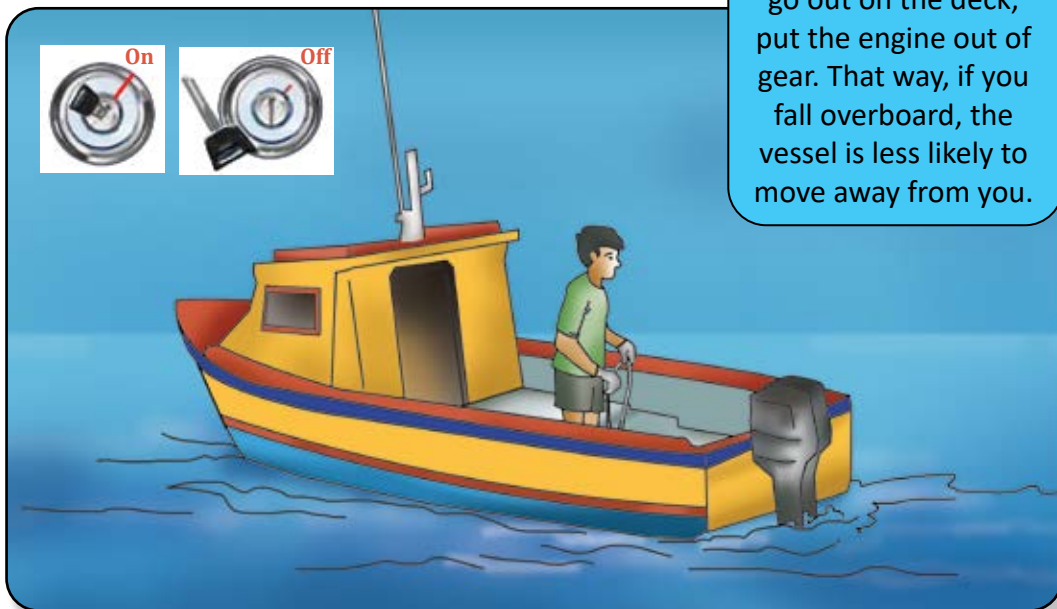
Do not use a draw-bucket when the vessel is moving. There is a danger that you may be pulled overboard.







Use gloves to protect your hands when hand jigging for fish.

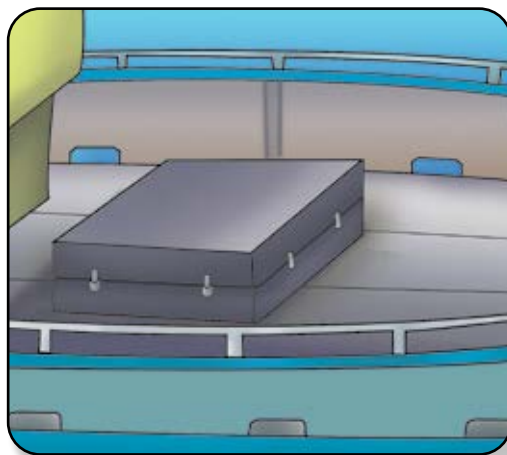
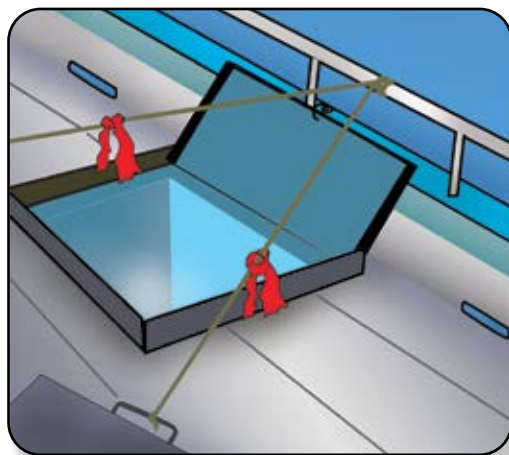


When traveling alone and if you need to go out on the deck, put the engine out of gear. That way, if you fall overboard, the vessel is less likely to move away from you.

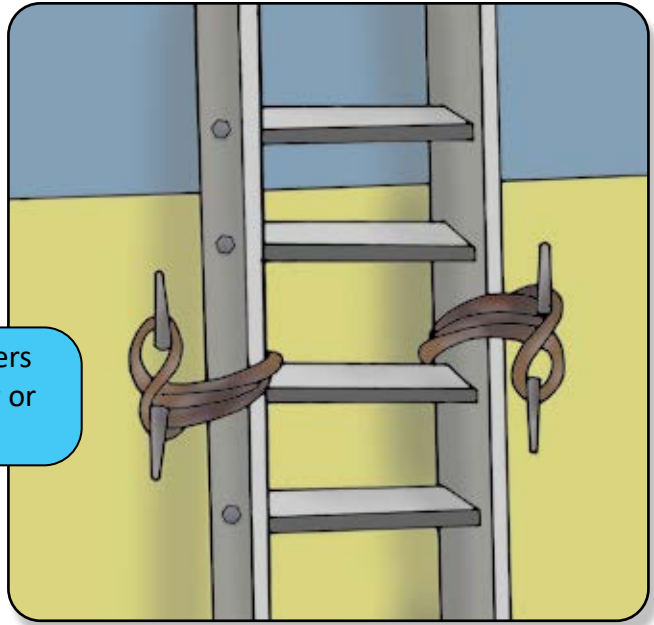
## Guard rails and ladders



Unused deck openings and hatches must be closed and secured to prevent down-flooding and also to prevent crew-members from accidentally falling into them. Make sure that manhole covers are sealed properly.



When not in use, keep ladders and gangways tied up below or store them safely.



Always check ladders before using them. Make sure to maintain them well.



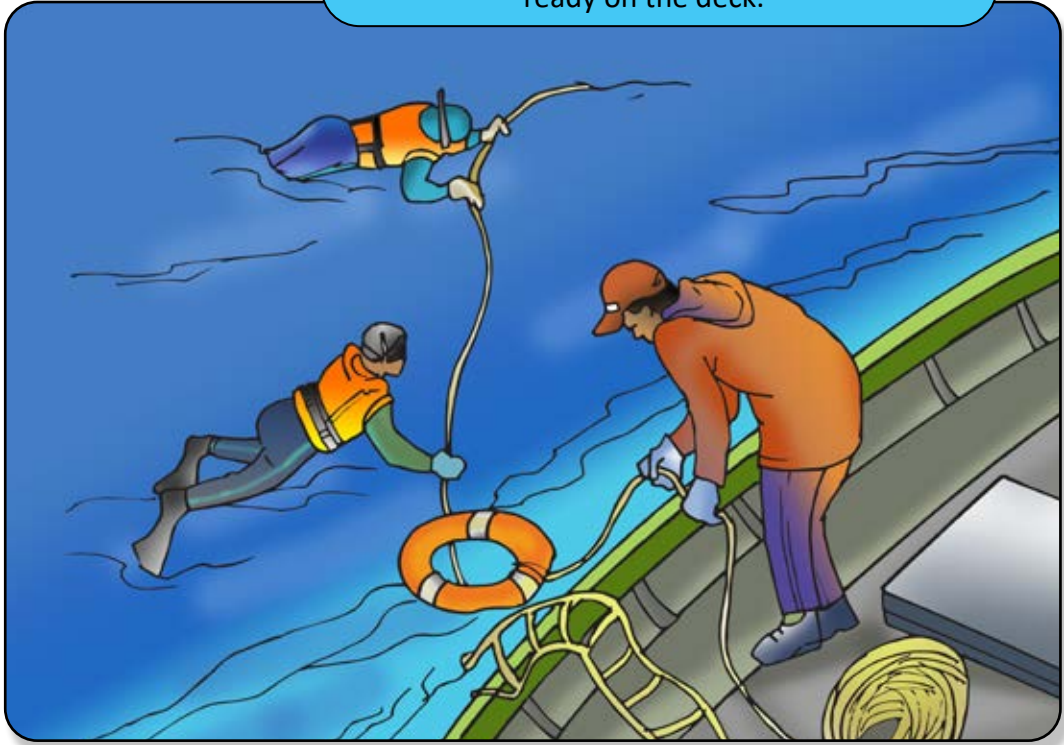


Avoid using foldable ladders. If a foldable ladder is to be used, make sure it is tied securely.



Keep ladders clean to avoid slipping.

When a crew-member is carrying out work in the water, keep a ladder or a rope ladder ready on the deck.



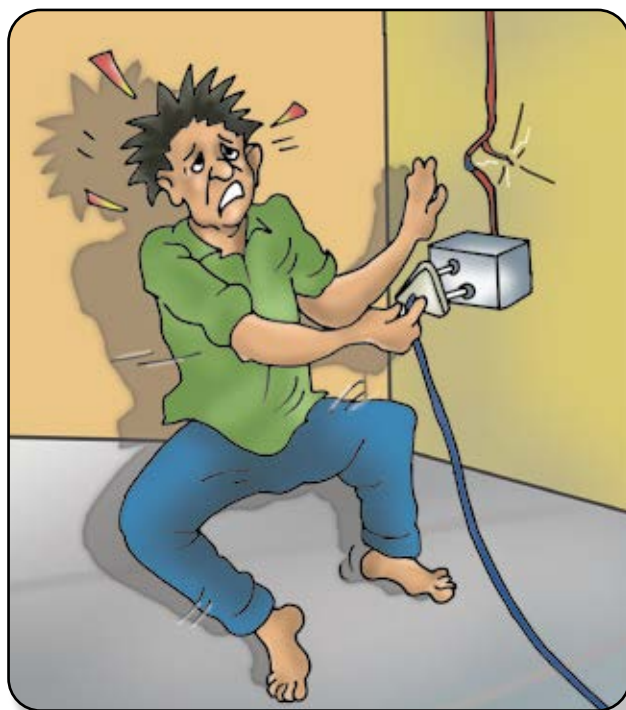
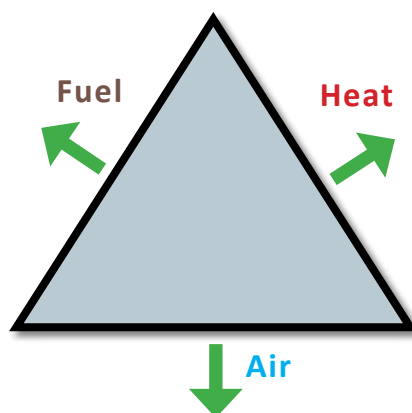
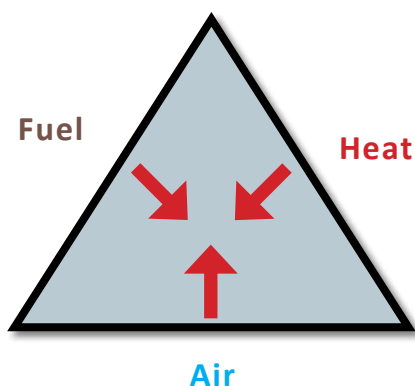
Use a bosun's chair when working aloft.





## Fire safety

At sea, fire is the most dangerous and life threatening hazard. Always keep your vessel free of fire hazards. Fuel, heat and air are the elements of a fire. To reduce risks, keep them separate from each other.



Make sure the electrical system is in order. Immediately replace any loose connection, damaged and exposed electrical cables, overloaded plug outlets and faulty switches.

Replace corroded gas regulators. Replace gas hoses before the expiry date or annually, especially if they are exposed to sun and weather conditions.



When not in use, turn off all burners and disconnect the gas regulator from the bottle. Use only approved types of hoses and regulators. Propane and butane gases, which are used for cooking, can be more dangerous than gasoline. These gases are heavier than air and if they escape, they collect in the lower parts of the vessel and are very difficult to remove. Make sure all cylinders are properly secured on open deck.

Use proper safe guards in the galley. Keep utensils in racks or drawers and use a guard rail on the stove.

Never leave a hot stove unattended. Grease or oil can easily ignite and cause a major fire.





Flammables should be stored in proper containers away from crew accommodation. Flammables should also not be placed close to open flames.



Always store oily rags in a non-flammable container. They may not start a fire, but can burst into flames by spontaneous ignition, without any other source of heat.



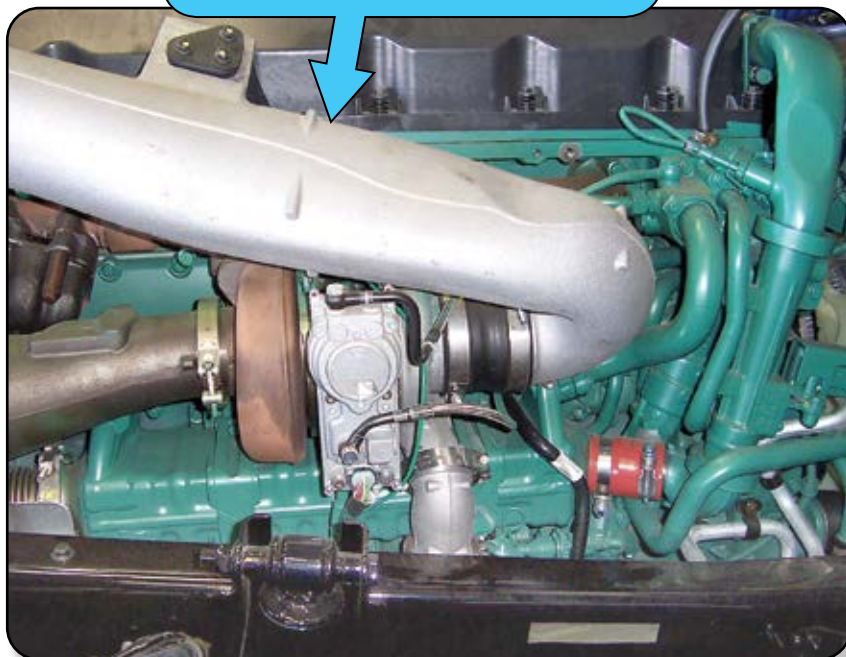


Smoking should only be permitted in a designated area of the vessel. A fire extinguisher and a bucket of sand should be placed in the smoking area to extinguish any fire. Never smoke in bed.

Fire extinguishers should be easily reached. Everyone onboard should know where they are, and how to use them. Periodical inspections must be carried out and they must be serviced before the expiry date.



Cover exhaust pipes from engines (as well as stoves) with a solid or perforated metal sheet.

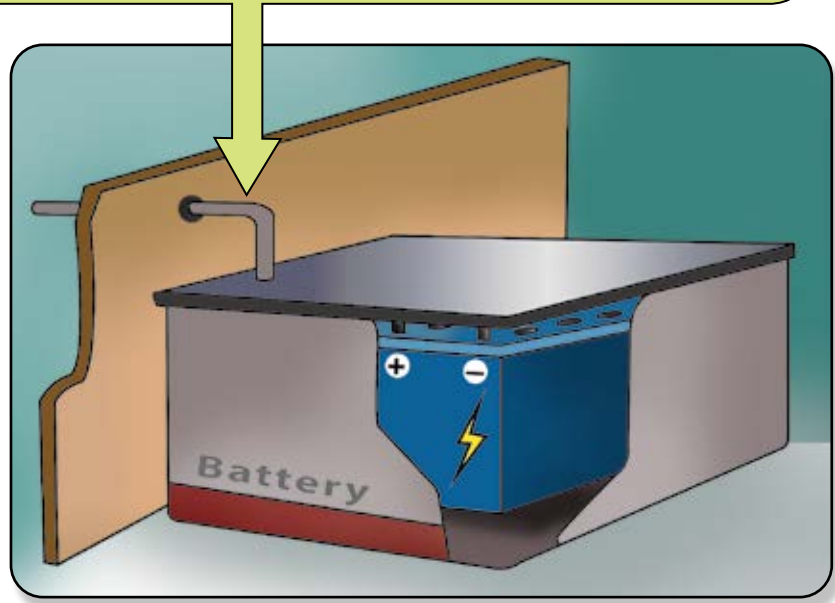


Do not hang washcloths, gloves, hats or other items over the stove to dry—they could fall onto the stove and catch fire.

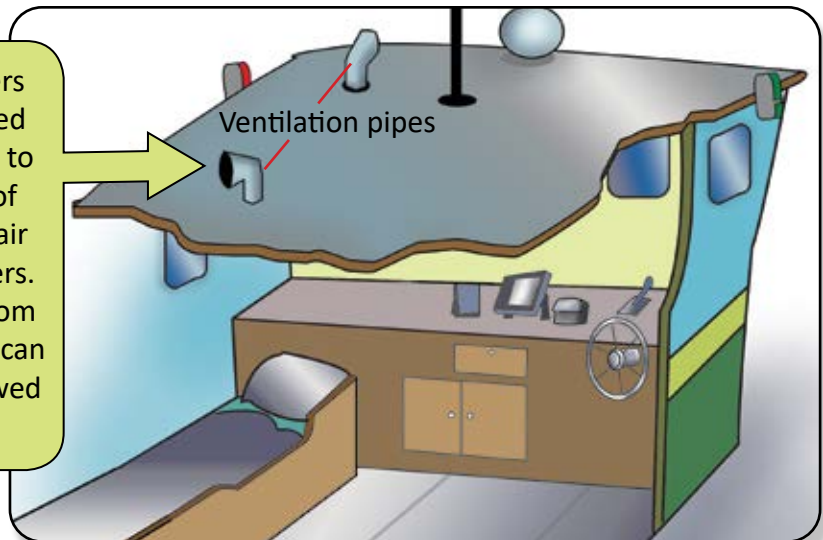


## Ventilation

Batteries should be well secured and maintained in properly ventilated areas that are easily accessible. Keep batteries away from water. Never store batteries in crew quarters. Fumes and gases emitted from batteries could be harmful if inhaled.



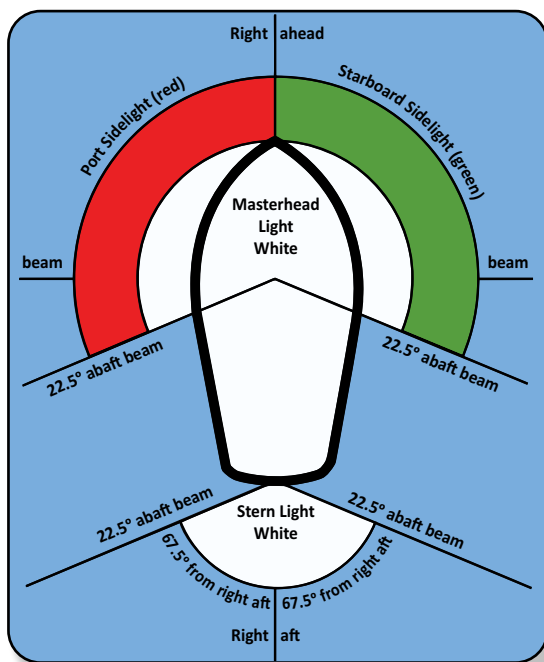
Sleeping quarters must be designed and constructed to allow for flow of sufficient fresh air for crew-members. Exhaust gases from the engine room can be deadly if allowed to build up.



## Lighting



During fishing, lighting on deck should not be turned off unless the fishing operation requires darkness. Lighting should be placed so that it does not dazzle a look-out or interfere with the effectiveness of the prescribed navigational lights.



At night, always carry a red light at port, a green light at starboard and a white light on the mast, even when you are anchored and not moving.

All work areas must have enough light to allow work to be carried out safely. Make sure that there is enough lighting in the stairways, companion ways and also near the ladders.



## Rope and wire handling

Rope of right hand lay taken from a new coil should be withdrawn from the inside counter clockwise to retain the twist.

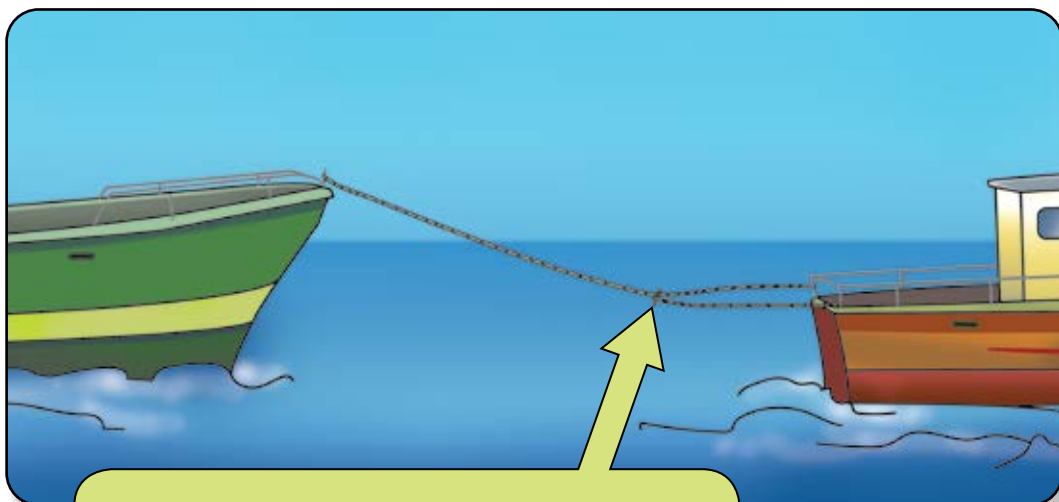
Kinks in ropes should always be taken out by correct coiling – right hand coiling for a right hand rope.



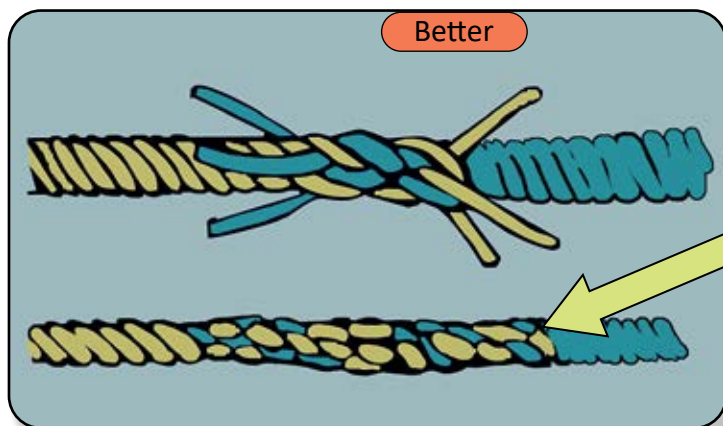
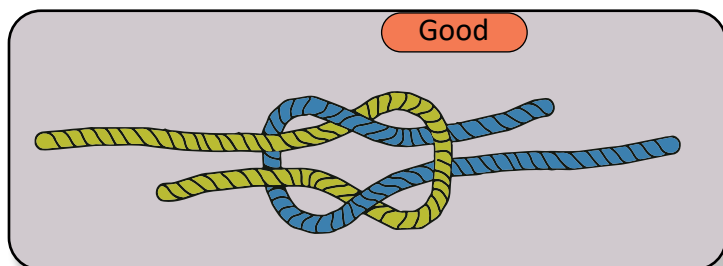
Replace a kinked rope or wire as soon as possible.

Pulling a kinked rope or wire through a block can be dangerous.

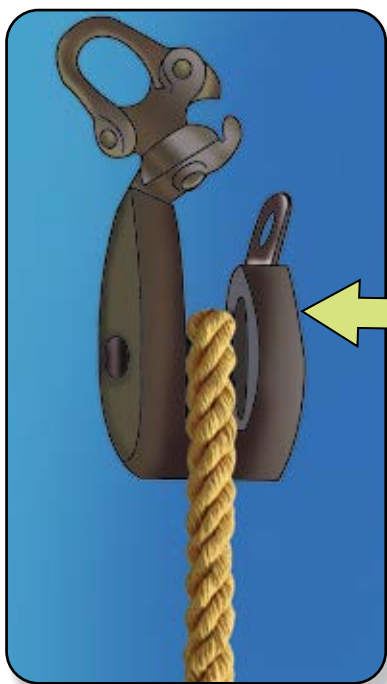




When towing a boat, do not give sudden jerk or pull, this may weaken the rope.



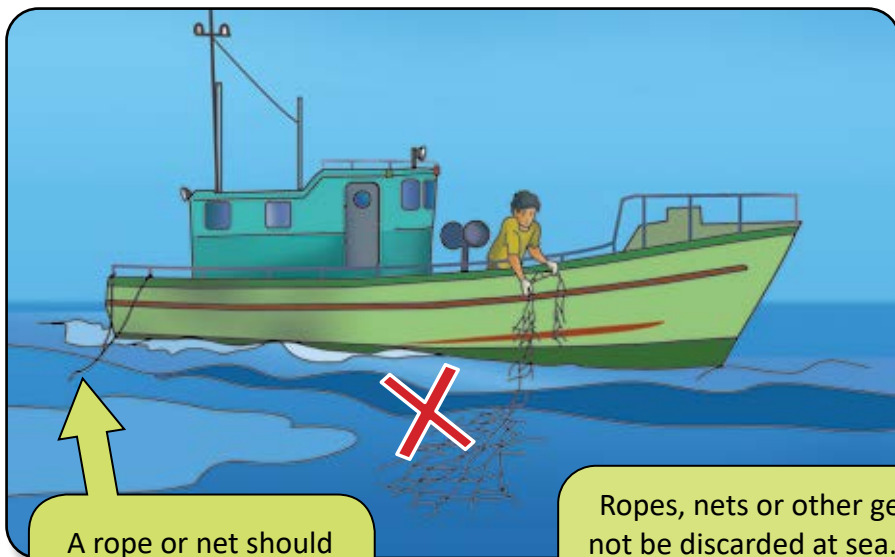
Where possible, a splice should be used in place of a knot as a knot can weaken a rope.



All blocks should be of sufficient strength and large enough for the rope. The diameter of the sheave should be suitable for the rope.

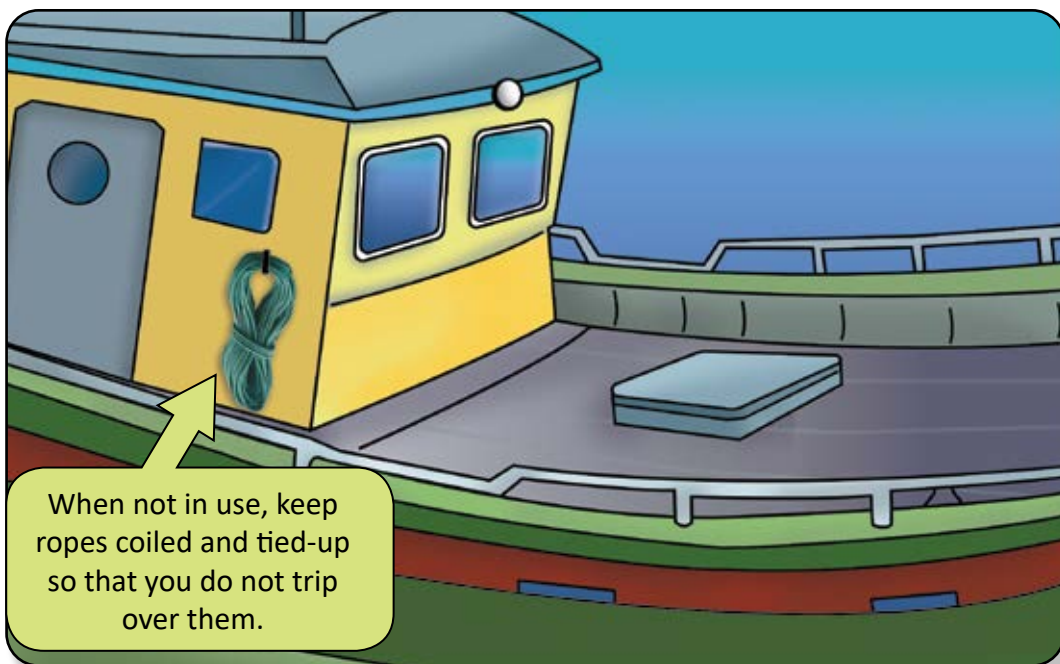
Know the safe working load of the rope, and do not exceed the limit. Never use decayed wires and ropes to lift weights.





A rope or net should not be thrown loosely over the side, as it may damage the propeller.

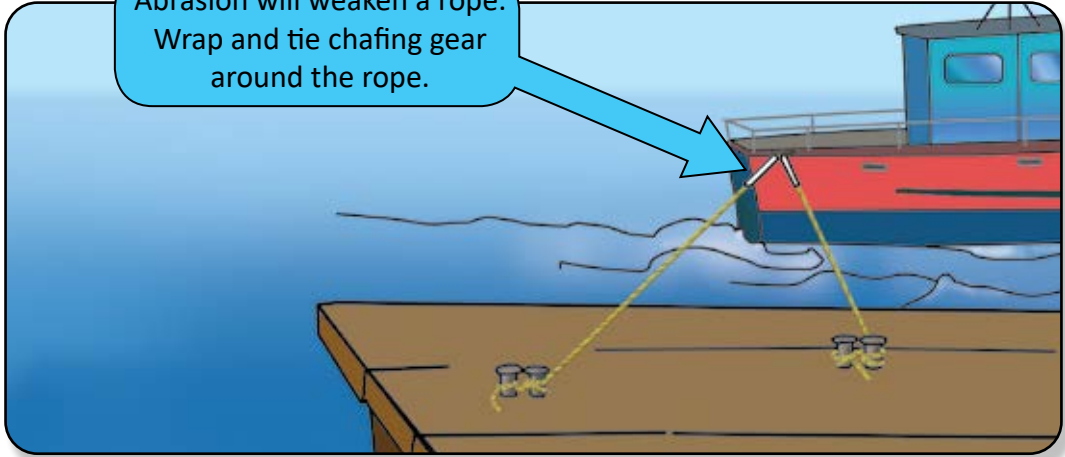
Ropes, nets or other gear should not be discarded at sea. Discarded gear may cause a danger to other vessels, lead to ghost fishing and pollute the water.



When not in use, keep ropes coiled and tied-up so that you do not trip over them.



Abrasion will weaken a rope.  
Wrap and tie chafing gear  
around the rope.



Do not expose  
rope to oil,  
gasoline, paint or  
other chemicals  
as this may spoil  
or damage  
the rope.



Never “fold” a  
rope or bend  
it sharply, this  
will weaken the  
fibers.



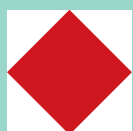
## International maritime signal flags



*"Keep clear of me;  
I am maneuvering with  
difficulty."*



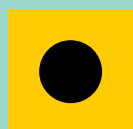
*"I am altering my course to  
starboard."*



*"I am disabled;  
communicate with me."*



*"I require a pilot."  
By fishing vessels near  
fishing grounds: "I am  
hauling nets."*



*"I am altering my course to  
port."*



*"I am on fire and have  
dangerous cargo on board:  
keep well clear of me."  
(or) "I am leaking  
dangerous cargo."*



*"I wish to communicate  
with you."*



*"My vessel is stopped and  
making on way through  
the water."*



*"Man overboard." (often  
attached to the man  
overboard pole on boats).  
With a sinister, hoist the  
semaphore flag.*



*"Keep clear of me. Fishing  
boats: "Keep clear of  
me; I am engaged in pair  
trawling."*



*"I require assistance."*



*"I require medical  
assistance."*



*"I am dragging my  
anchor."*



*"I require a tug."  
By fishing vessels near  
fishing grounds: "I am  
shooting nets."*

## Personal safety





## Personal safety

Never stand right under hanging weights, raised booms, derricks and cranes. Do not use decayed wires and ropes to lift weights.



Avoid standing close to wagging weights, unless they are properly secured.



Avoid standing in line with tensioned wires and ropes. In the event of breakage, tensioned wires and ropes move towards the direction of the pull and can harm the body.



Do not stand on a tensioned wire or a rope. If it snaps you could be injured.



Use a safety belt while working aloft. If you slip, your safety belt will stop you from falling.





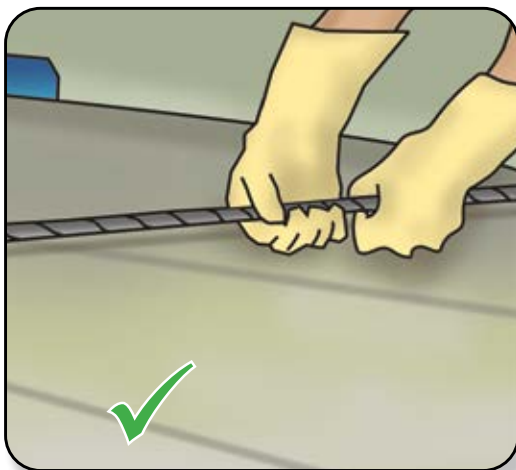
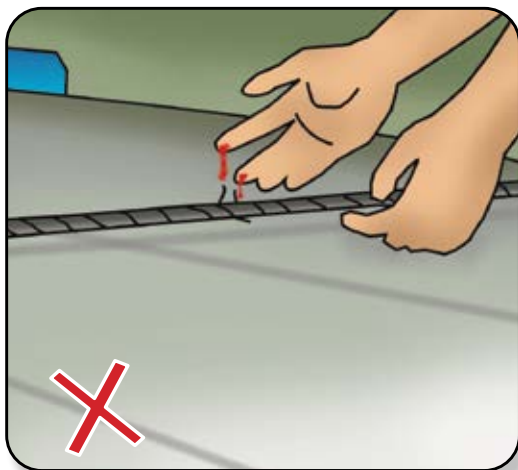


Do not wear flip-flops; use proper footwear to avoid slipping on the deck.

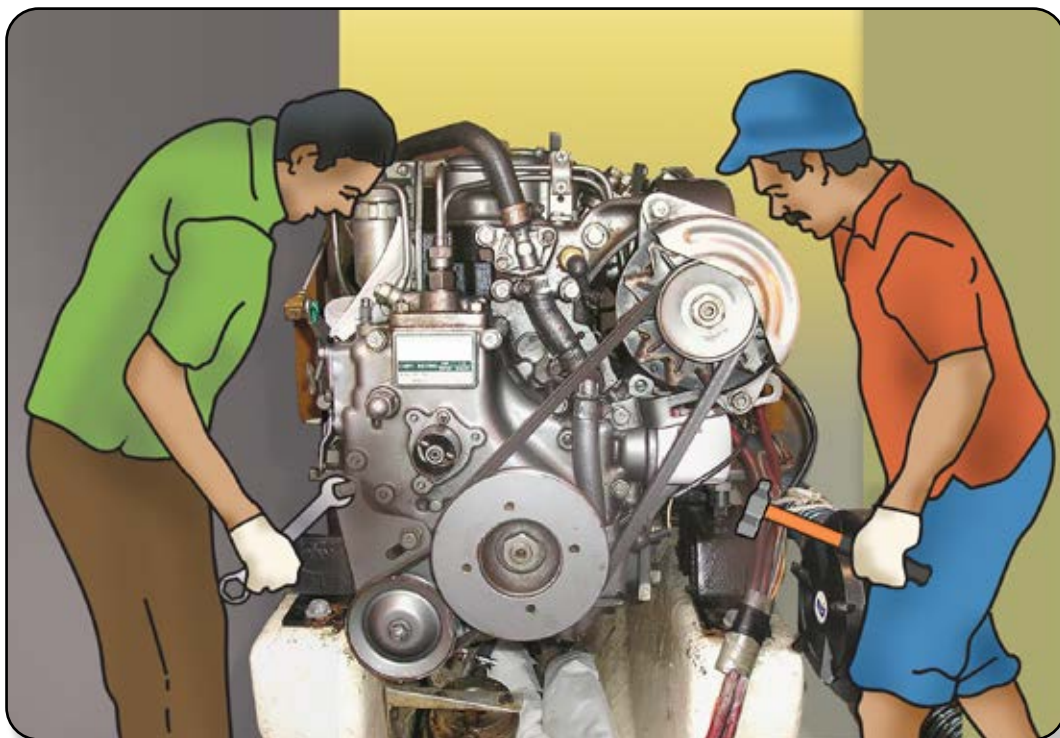


Do not step on partly open hatch covers or manholes. If the cover shifts, you could fall down the opening.





Wear gloves when handling ropes or wires.



Never carry out repairs or adjustments on running engines.





Avoid lifting a large heavy fish while facing the front of the moving vessel. Always leave the fish abaft of the vessel from your standing position before lifting it. This position allows you to let the fish go with the movement of the vessel in any difficulty.



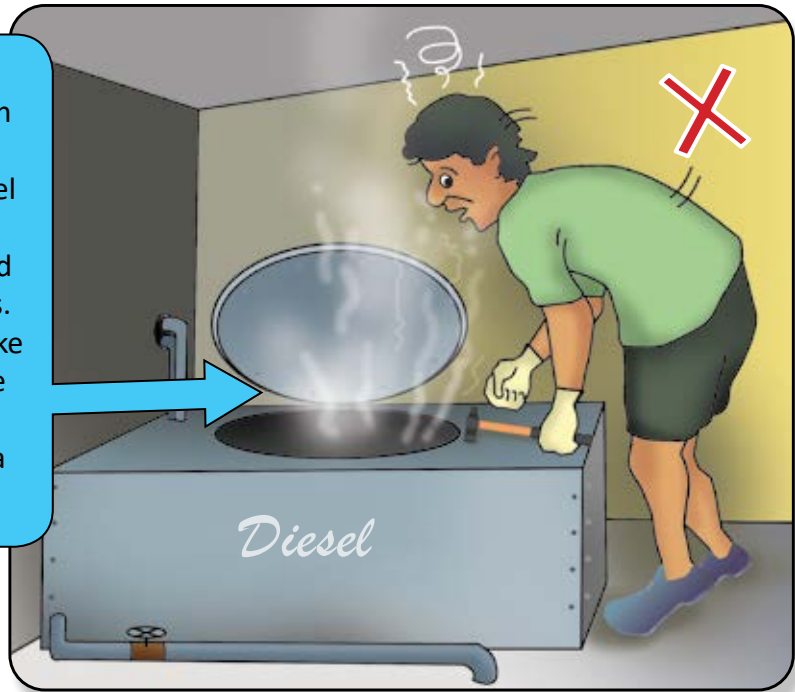


Do not sit on the railings to avoid falling overboard.

Do not go alone onto the deck at night or during rough seas. When heavy weather or work conditions require, crew should wear safety lines to protect themselves from falling overboard.

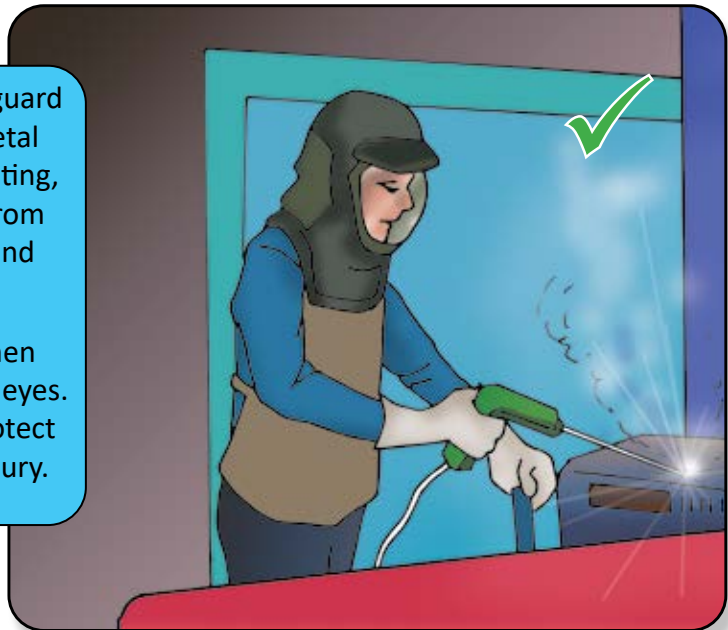


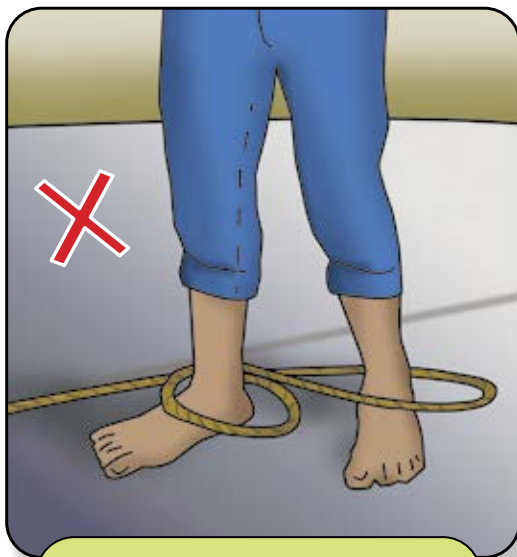
Make sure there is good ventilation when you open the fuel tanks. Fuel tank fumes are bad for health and can be dangerous. Poisonous gases like carbon monoxide may be found in tanks closed for a longer period.



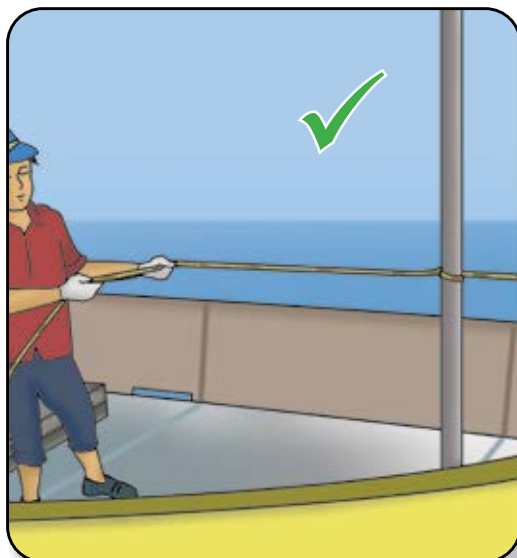
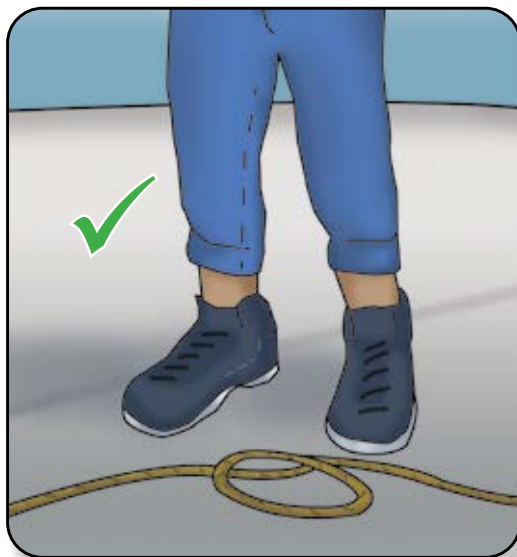
Wear appropriate eye-guard when attending to metal work, welding and painting, to protect your eyes from rays, flying particles and irritant vapors.

Wear dark glasses when welding to protect your eyes. Also wear gloves to protect the hands from any injury.





Do not stand in a bight of rope or wire. If it tightens suddenly, a serious injury may occur.

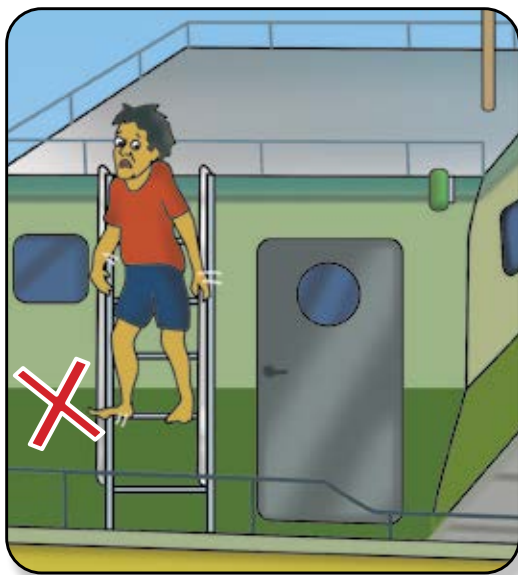


When surging or taking the slack of a rope, always hold the rope with clear distance from the bollard.

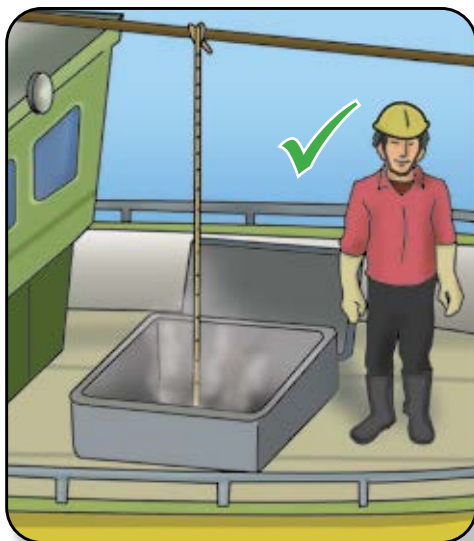


Do not run over the deck or on ladders. You are more likely to slip, trip or fall. Never jump. Always use the ladder or the gangway when boarding or leaving the vessel.





When climbing a ladder or steps, keep your front facing the ladder or the steps, holding the grab rails firmly. You should be able to see each step you take. This positioning helps you to maintain your balance even during heavy rolling. Always face a ladder when climbing or descending it.



When going below deck in the ice compartment or a freezer, use proper clothing, shoes/boots, gloves and a helmet to protect yourself.





Do not expose your body to direct sunlight. Over exposure to ultra violet rays may cause skin problems or even cancer. Wear a cap or hat, clothes with long sleeves and use sun cream frequently.



Wear sunglasses on sunny days as continued exposure to the sun is bad for the eyes.



Never lift heavy weights by bending only your spine. Rather, bend your knees to half-sitting position with your feet a little apart, hold the weight properly, keep your back straight and stand with the weight. This will prevent back injuries, which could have serious consequences.



Make sure doors and windows are fastened. Rolling and pitching may swing a door or window and cause injury.



Always care for your hands and protect them from possible injuries.



Take all precautions while handling electrical wires and fittings. Keep crew informed before working on electrical systems.

Do not stand on open deck when there is lightning. You will be the highest point for the lightning to earth itself through your body.  
Always stay inside the wheel house so that you are shielded by the roof.



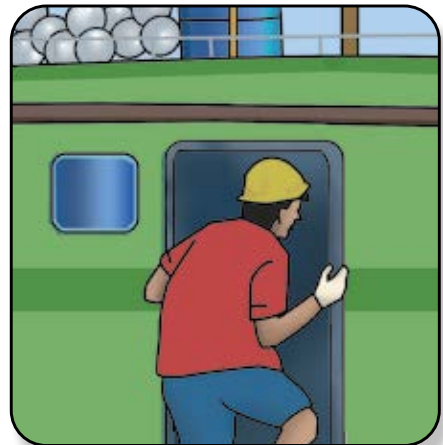
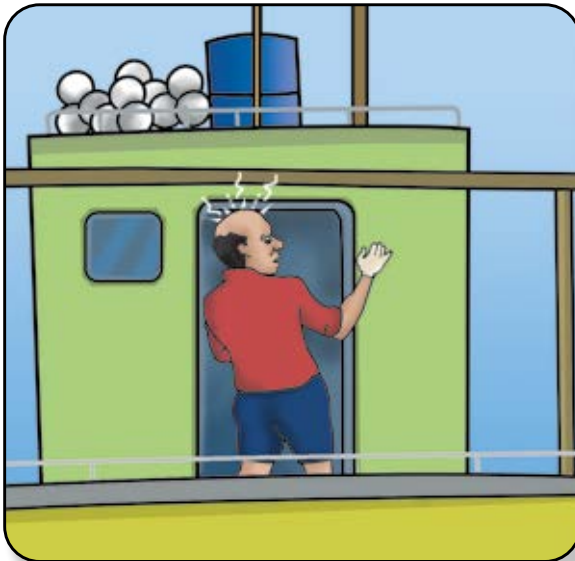
Wear dry, clean and tidy clothes as much as possible. Wear a hard hat or a helmet when working under moving equipment or when working under objects that could fall.



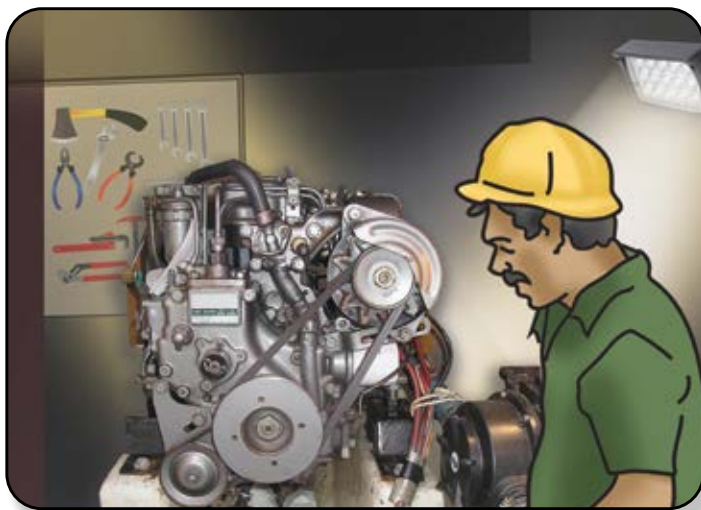
Always keep your seaman knife in a cover to prevent accidental cuts and abrasions.



Always mind your head when entering through doors. Vessels' door frames are lower than domestic ones.

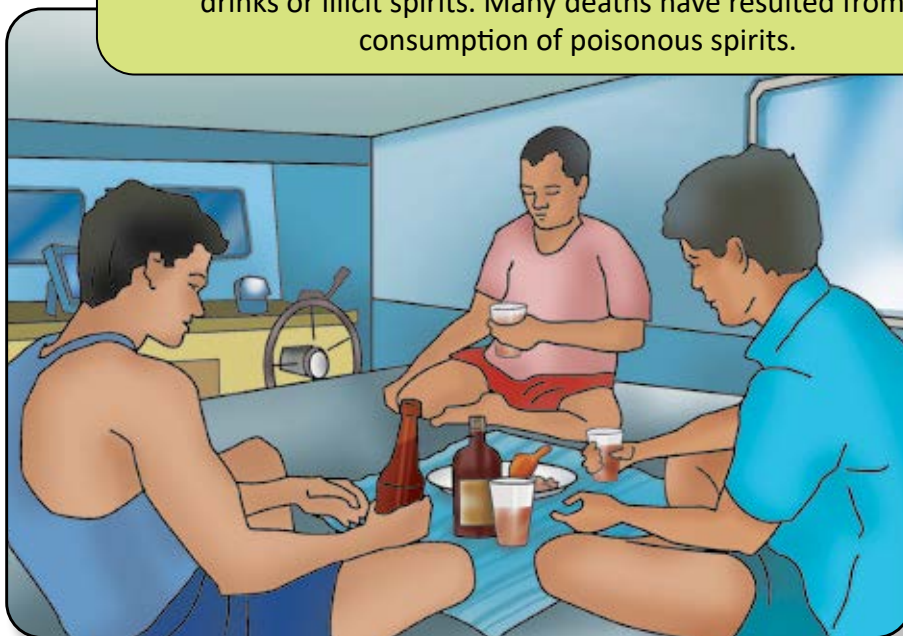




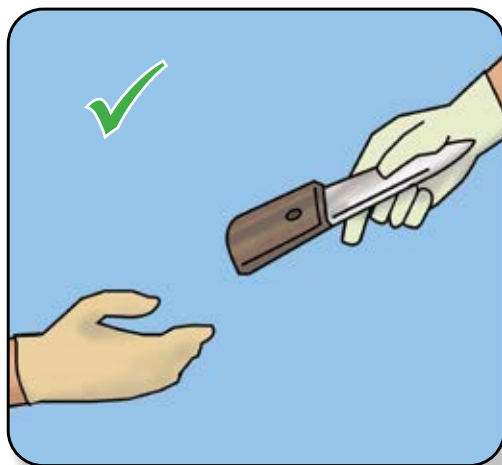
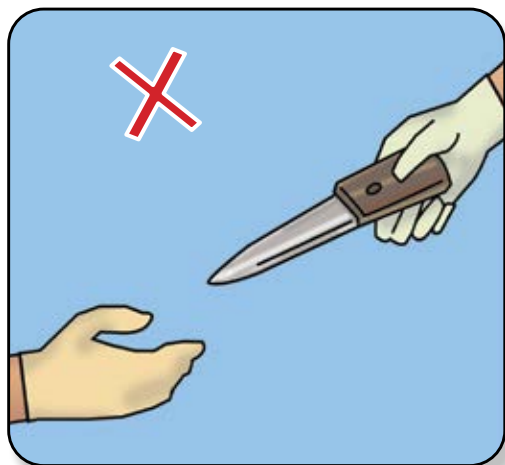


Do not enter the holds or hatches unless they are sufficiently illuminated. In addition to the normal lighting, emergency lighting must be available in the engine room and in the wheel house.

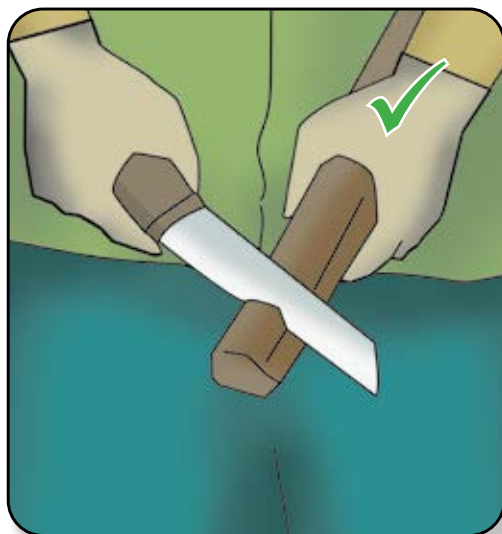
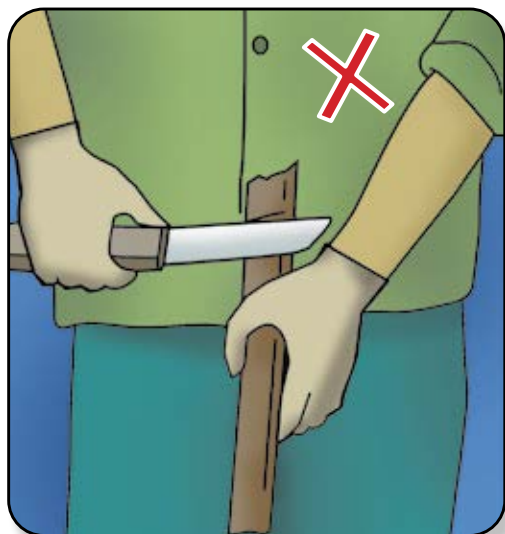
Excessive use of alcohol or misuse of drugs is a threat to the safety of the vessel and the crew. Do not consume strong home-made alcoholic drinks or illicit spirits. Many deaths have resulted from the consumption of poisonous spirits.



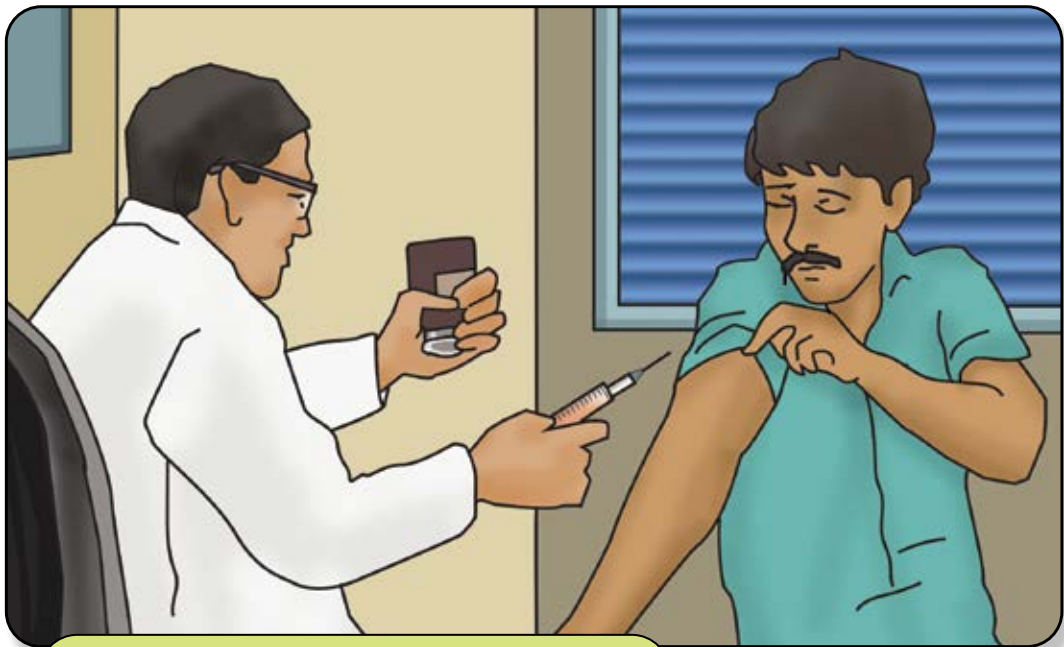
Do not pass any sharp tool or object while holding the handle. Always hold the sharp end yourself and then pass it to the receiver.



Never cut hard objects or bait facing the knife towards yourself. Always cut away from your body.







Have yourself vaccinated before going on a fishing trip to prevent possible virus attack.

Never drink sea water even if you are in a desperate situation. You can survive longer without drinking water, than by drinking sea water.



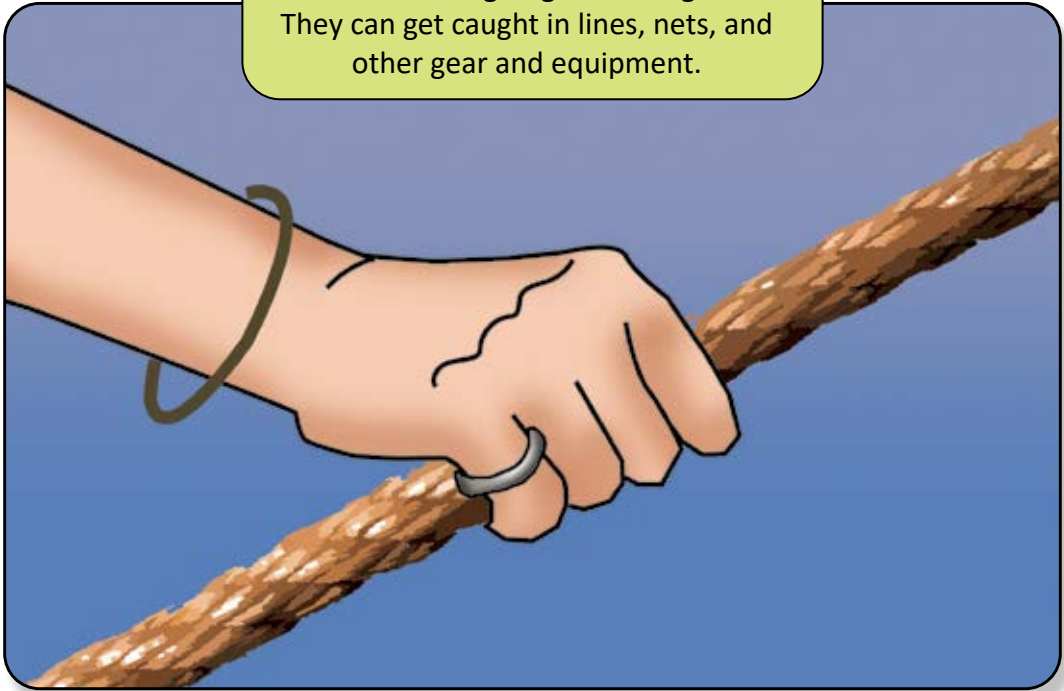
Wear close-fitted clothing, which is less likely to get caught in winches or machinery. Exposed buttons can get caught in nets and other fishing gear. Keep them covered with tape to reduce the risk.



Keep long hair tucked under a hat. This way, hair is less likely to get caught in pulleys, winches and other equipment.

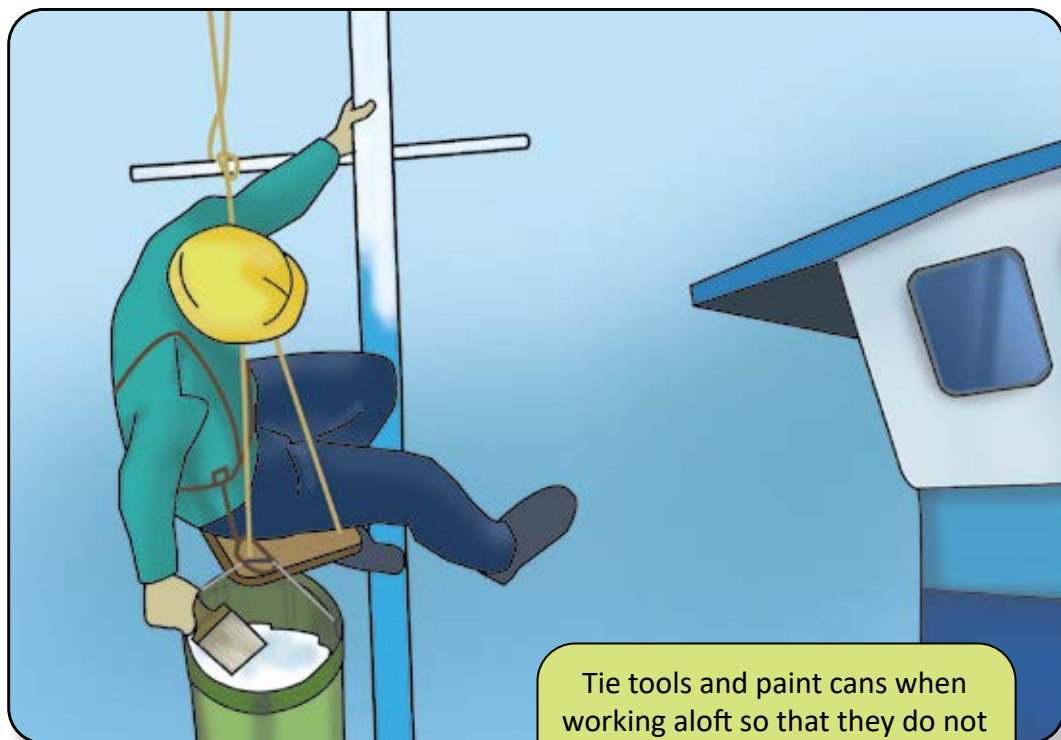


Avoid wearing rings and bangles. They can get caught in lines, nets, and other gear and equipment.



Take care when the engine room hatch cover is open. In some boats, the access to the engine room is from the accommodation area. Therefore, you could easily fall into the engine room through the opening if you fail to see it.



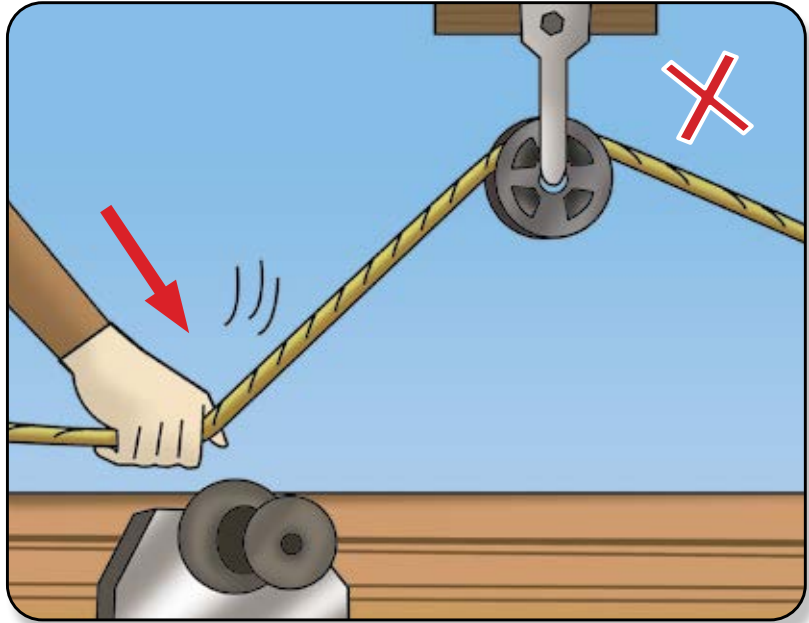


Tie tools and paint cans when working aloft so that they do not fall and injure those below.

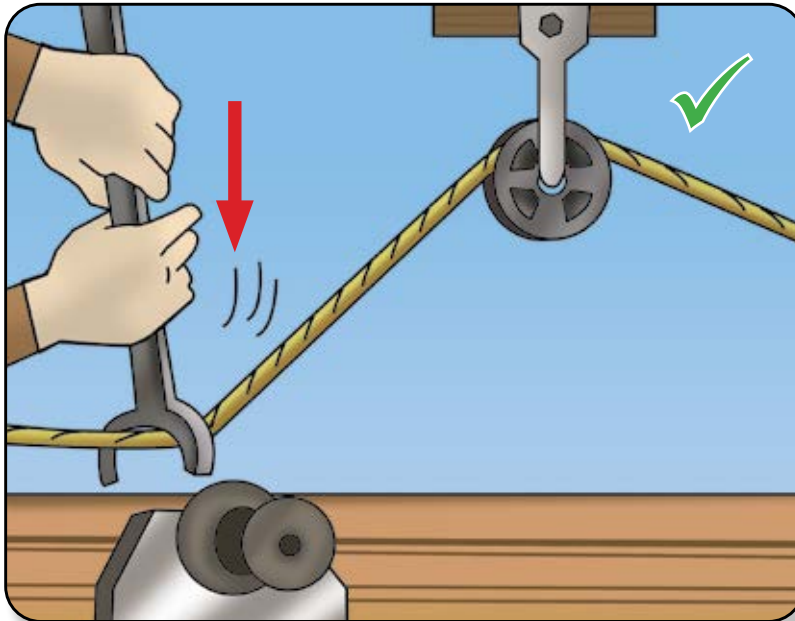


Do not interfere in other's work unless you are invited. Dress suitably when in the working area.





Never attempt to guide a rope to a pulley with your hands.  
Use a lever. Never grip a moving line.





During your time off, make sure you are away from the work place and take adequate rest.

Do not try to control a large fish when it is alive. A shark's mouth may still contract for a period of time after the fish is killed. Skate has a poisonous spike in the middle of the tail and getting stung by it could be fatal.

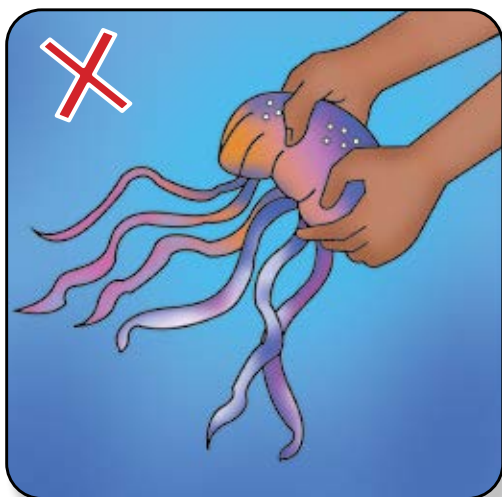


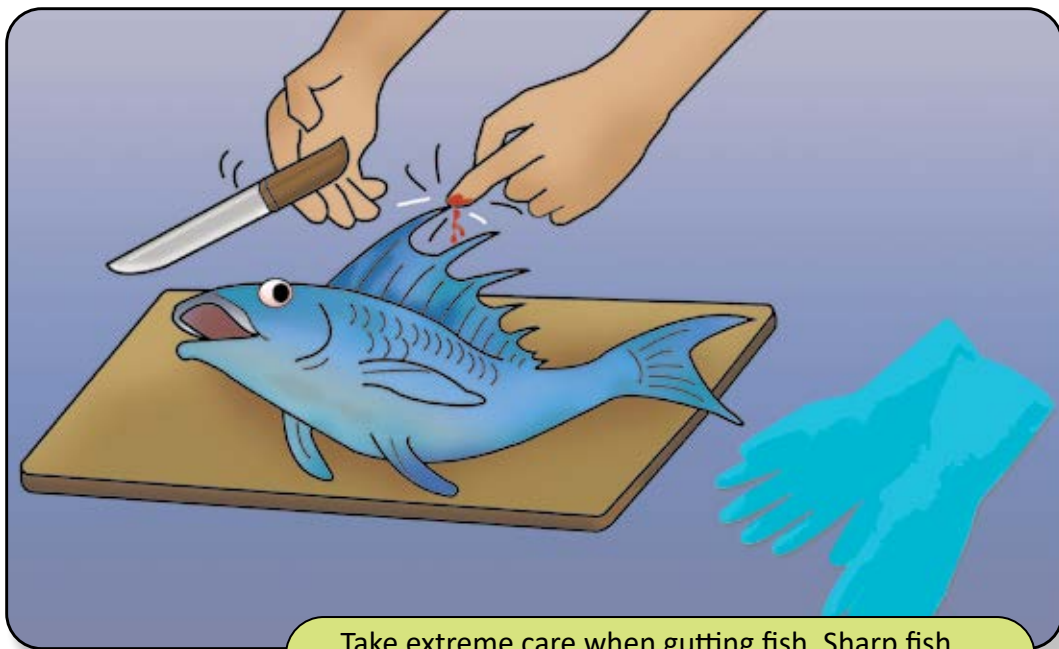




Do not eat inflated spiked fish, they could be poisonous. Fish covered with scales are safer to eat.

Do not touch jelly fish or other living organisms floating in the water with bare hands. They can irritate the skin when touched.





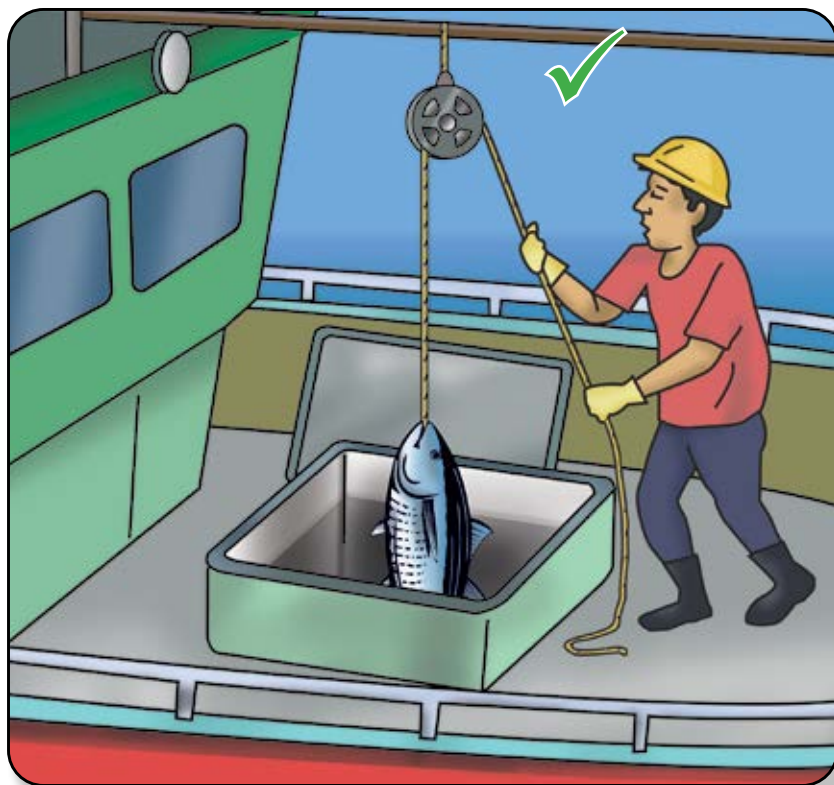
Take extreme care when gutting fish. Sharp fish bones, teeth and fins can be dangerous.



Protect your eyes from flying fish hooks by wearing sunglasses or safety glasses.



Never lift a heavy fish, use a winch or a tackle.





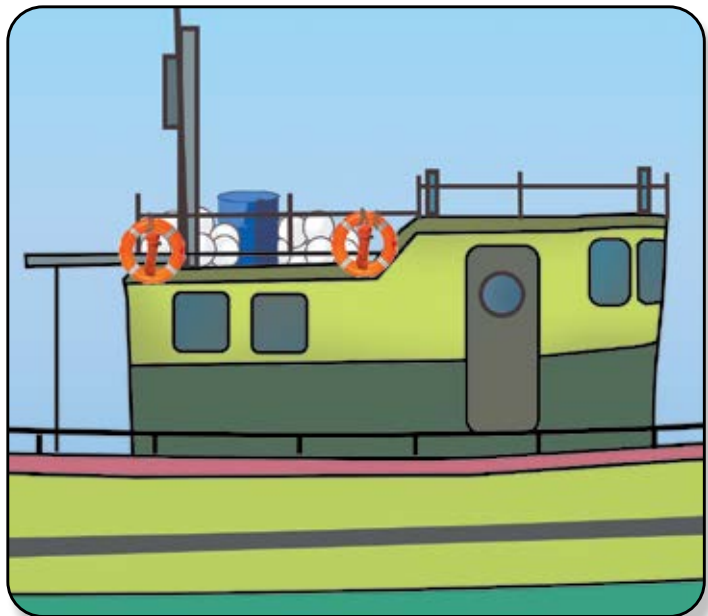
Wear safety shoes when handling large frozen fish.

## Safety and health of the crew

- The skipper, as the owner's representative, has the overall responsibility for the safety and health of the crew and the safe operation of the fishing vessel.
- Crew should co-operate with the owner, the skipper and other crew members to maintain their own health and safety as well as the health and safety of other crew members and other persons on board.
- All crew members should keep the skipper and their colleagues informed of any allergies to certain types of medication (if any) and also of all other medical requirements.
- If there are any crew-members who are on medication, they must carry medical supplies sufficient for the duration of the entire fishing trip.
- The crew-members should be free of any encumbrances which hamper their stay out at sea.
- Any member of the crew that is suspected to be ill, should not be enlisted for the fishing trip.

## Precautions against falling overboard

- Always be on guard against falling overboard as it is a major cause of fatality at sea.
- In the event of a change of course or speed, warn the crew, as the change in motion may catch them unaware.
- Lifelines should be set up, as appropriate to the class and size of the vessel to prevent crew members from falling or being washed overboard in bad weather. Lifelines with manropes should be rigged on the working deck.
- When work is carried out where there is a risk of falling down or falling overboard, or when work is carried out on the deck in bad weather, a safety harness with a safety line attached should be used. The length of the safety line should be adjusted to prevent falling overboard. If safety harness and safety line cannot be used, then use a life jacket or a safety work vest instead.
- Work outboard while the vessel is under way should be carried out only when absolutely necessary. Necessary safety precautions should be taken before such work takes place.





## Life-saving apparatus

Life jackets of approved type should be available on board for each crew member.

Wear your life jacket when working on deck. Your survival chances in water are much higher with a life jacket.



Life jackets should be readily accessible and their position should be clearly indicated.

Life rings should be available onboard to facilitate a person gone overboard. Keep ready a life ring fitted with a self-igniting light or a buoyant lifeline.

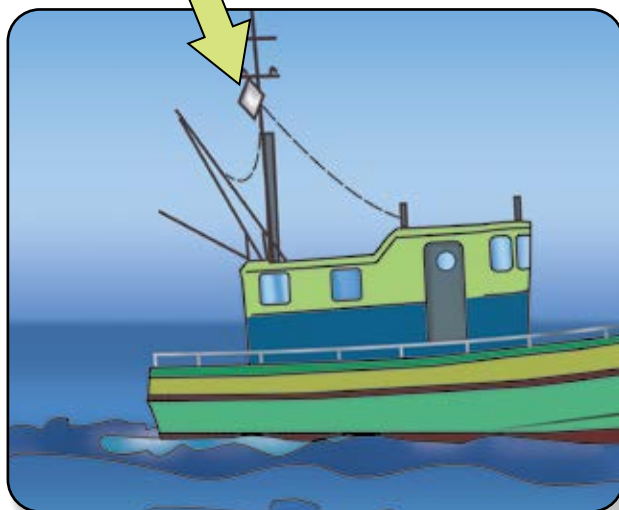






Flares, smoke signals and parachutes should be available onboard in order to indicate your position to other vessels when you require assistance in an emergency.

A radar reflector allows an approaching vessel to see you on their radar well in advance. This will allow them sufficient time to avoid you and your nets and lines, which could be damaged if over run. A radar reflector fixed on the vessel also makes it easier for rescue vessels to locate your vessel in an emergency situation.



## Dive fishing safety

Small-scale fishers who use scuba or surface-supply diving gear must be trained in the use of the equipment and procedures necessary for their diving activities.

For all diving operations, minimum crew requirements must be followed. A diving supervisor must be on-site and in control.

Other requirements include:

1. Employers must ensure that all divers have completed adequate training and know-how to use the diving gear.
2. When diving is in progress, a standby diver must be on the dive site at all times to give emergency aid, if needed. The standby diver must be able to enter the water within one minute.
3. Each vessel used for diving operations must have a radio or a phone to allow voice contact with emergency services.
4. Dive vessels must have all necessary first aid equipment, which should also include an oxygen therapy unit. Each diver must be qualified in artificial respiration (CPR) and oxygen therapy.
5. Both the diving supervisor and the diver must keep separate diving logs. The log must include the type of apparatus and gas medium, times, maximum depth, surface interval, decompression tables used, date, and remarks. The diving supervisor log must be completed with the employer after the dive.
6. Vessels engaged in diving operations must display or fly the international code "Alpha". Display this flag only while diving operation is in progress and remove the flag when all divers are out of the water.
7. Each dive vessel must have an up-to-date list of the locations and telephone numbers of nearby facilities with recompression chambers for emergency services such as the coast guard, medical airlifts, navy and doctors knowledgeable and competent in diving medicine.
8. Divers aged 40 and over must be examined at least once every year by a doctor knowledgeable and competent in diving medicine. Divers under 40 must be examined every two years. After each dive, divers must wear a medical alert tag for at least 24 hours. These tags will state that the wearer may be susceptible to diving illnesses such as decompression sickness.



9. A ladder should extend far enough into the water so that a diver can easily climb back onto the boat.
10. Be careful that you do not rise too fast to the surface, as this may cause decompression sickness.
11. Each diver must be in constant communication either with a buddy diver or with the surface by means of lifelines, floats, or voice communication.
12. Divers must not stay at any depth longer than the maximum time planned.
13. Scuba divers must not dive deeper than 40 metres (130 feet).
14. Scuba cylinders must be visually inspected internally every year. Cylinders must be hydrostatically tested every five years.
15. As a minimum, scuba divers must use the following equipment as specified by the diving supervisor:
  - Scuba unit with a quick-release harness and a pressure gauge
  - Face mask and snorkel
  - Swimming fins and/or boots
  - Wetsuit or dry suit
  - Gloves
  - Diving knife
  - Depth gauge, submersible pressure gauge and compass
  - Buoyancy Control Device – BCD
  - Air cylinder (scuba tanks) and regulator with two mouth pieces
  - Underwater watch with an elapsed-time indicator or dive computer
  - Weight belt with a quick release buckle
  - Underwater flashlight
  - Surface Marker Signal/Buoy (SMB) Kit
16. Surface-supplied divers must know their depth and time limits to ensure safe diving.
17. Surface-supplied divers must have a diver's tender.
18. Each diver's air line must have a pressure gauge and a separate valve. The gauge must be downstream from the valve.
19. Surface-supply hoses must be attached to life lines to prevent undue stress on the supply hose or the helmet. Lifelines must be 16 mm in diameter, made of polypropylene or an equivalent synthetic fiber. Divers must use only hoses designed and suitable for surface-supplied diving.





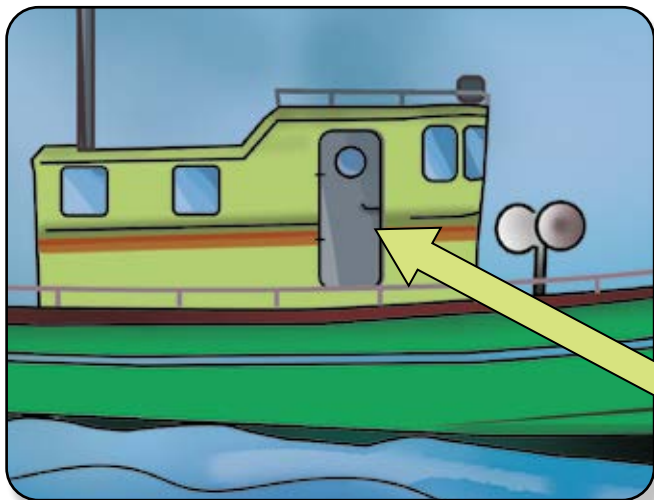
## Stability





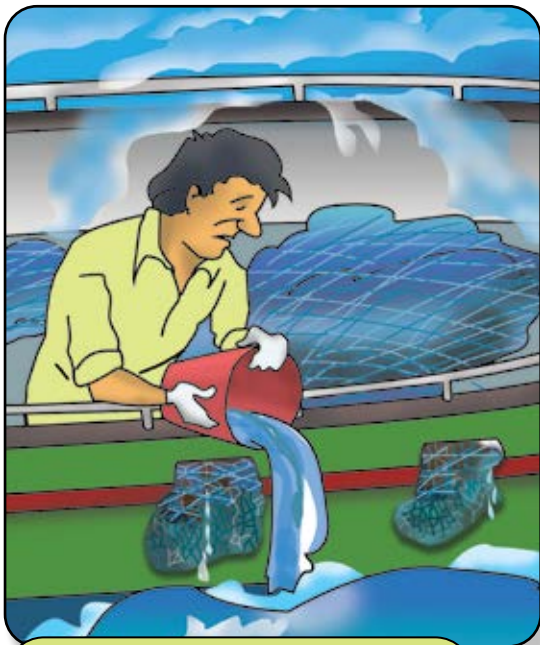


## Stability

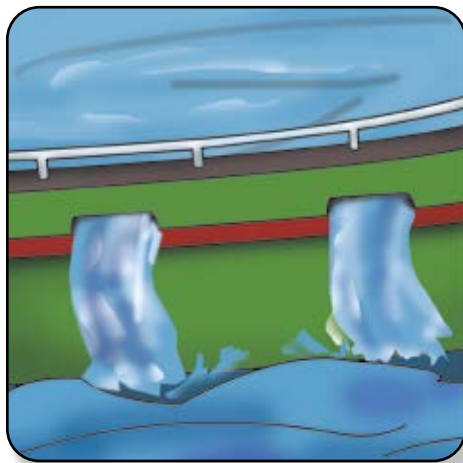


Keep all watertight doors closed unless they are actually being used.

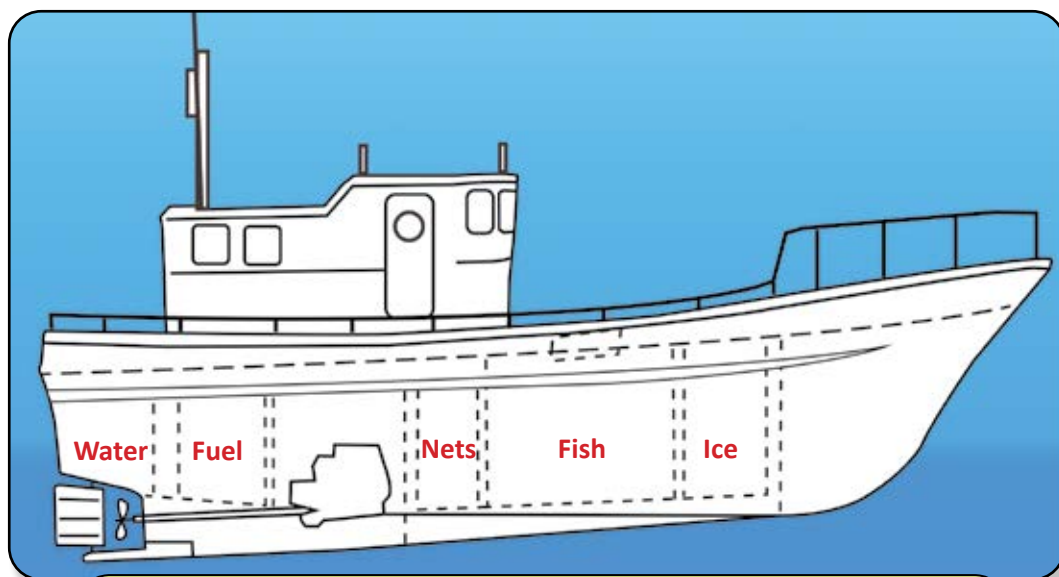
Make sure that these watertight doors are securely closed, especially when rough weather is forecasted.



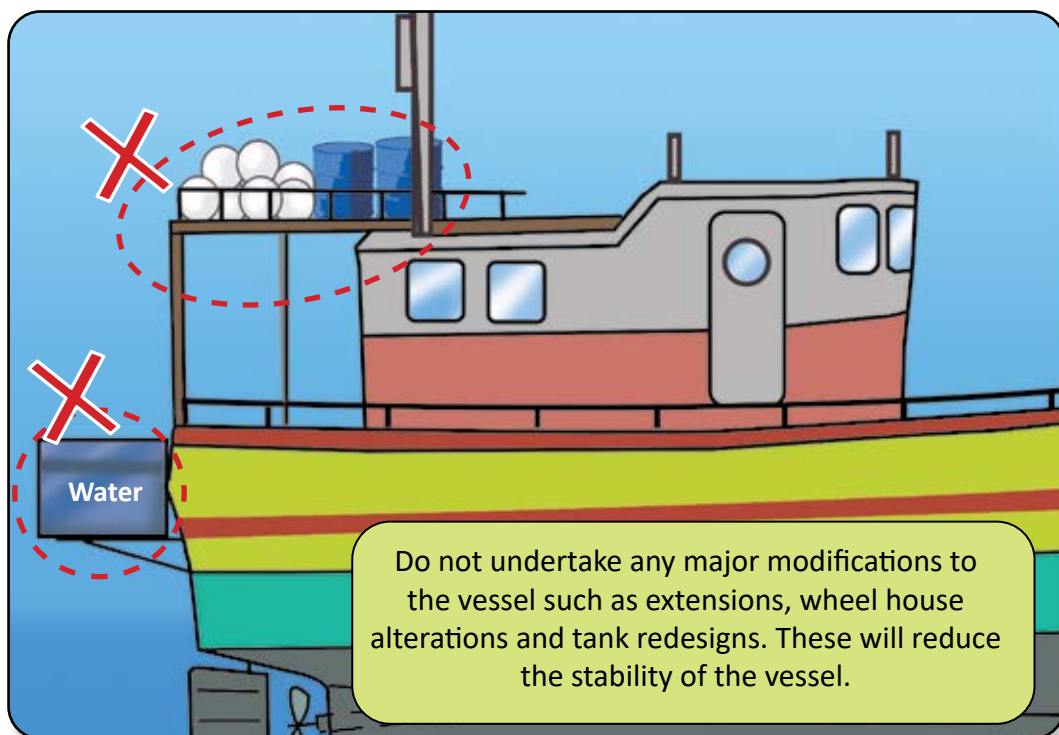
Blocked freeing ports can pose a serious hazard to the stability of the vessel.



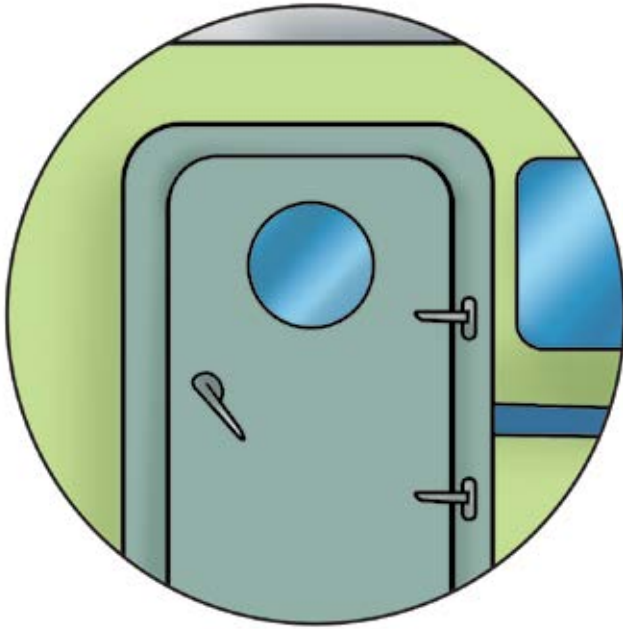
Make sure that all the freeing ports are open to allow seawater that lands on deck during rough seas to quickly drain out.



Make sure the vessel is not overloaded. Maintain a practice of keeping heavy weights as low down as possible. This improves the stability of the vessel and makes it less likely to capsize.

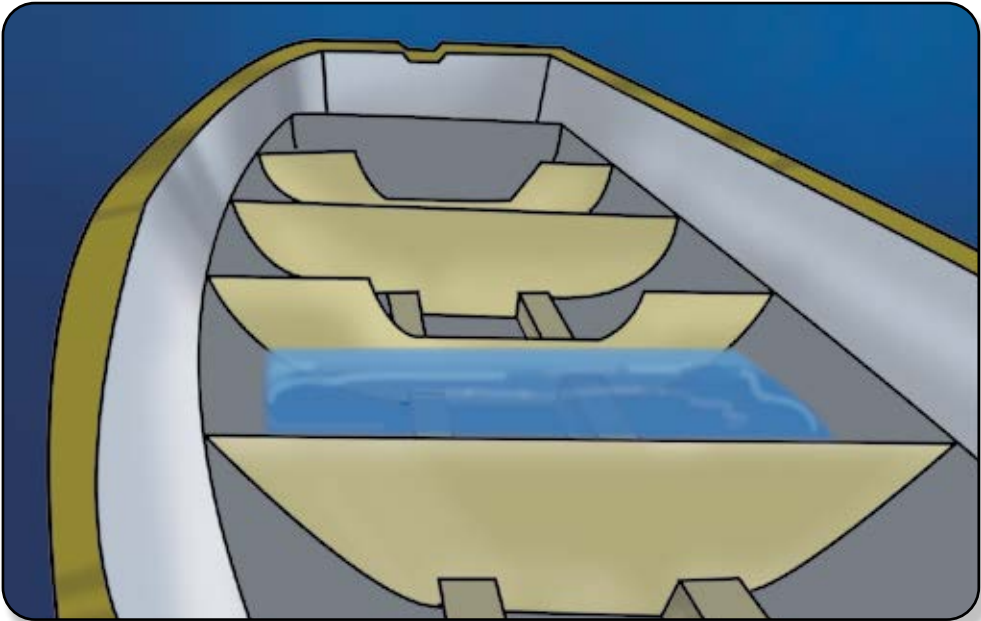


Do not undertake any major modifications to the vessel such as extensions, wheel house alterations and tank redesigns. These will reduce the stability of the vessel.



Inspect and grease all dogs (door handles) regularly.

Make sure all the bulkheads are water tight.



# Passage to fishing ground and back to the harbour

## Maintaining stability of the vessel

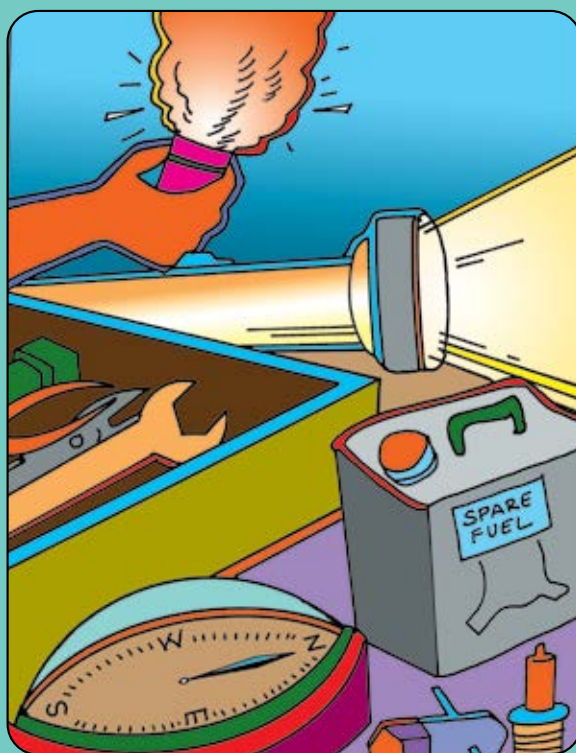
- Load the vessel as per the recommendations in the stability booklet provided by the boat builder. Never overload the vessel. Vessel owners must ensure that the vessel is not overloaded with fuel, ice, and other provisions that are required for staying out at sea for a longer period.
- Fishing trips should be calculated and planned in accordance with the capacity limits of the vessel. Draft marks and the load line marks are excellent means of determining whether the boat is overloaded.
- Do not leave fish slack on the deck or in the hatch. Fish that can move freely makes the vessel less stable. Proper removable separation boards will help to keep the fish load stable.
- Take extreme care of stability while hauling gill nets or purse seine nets by winches. A heavy load of fish in the net can seriously reduce the stability of the vessel.
- Many multi-day boats stack their dry fish on top of the wheel house in bulk. This should not be done as the stability of the vessel will be considerably reduced.
- Whenever possible, do not allow tanks to be half-filled as the free surface effect reduces the stability of the vessel. The tanks should preferably be either completely full or completely empty.
- Always try to maintain a good stability of the vessel, without the vessel being too tender or too stiff.
- Pump the bilges regularly and ensure that they are empty.

### You are in danger if....

It takes longer and longer for the vessel to complete a roll as your stability is decreasing. Therefore, you should pay constant attention to the way your vessel rolls. You need to watch the end of the roll. If the vessel hangs at the end of the roll instead of immediately returning to the upright position you are in real danger.



## Survival at sea





## How to act in the case of engine failure

In the event of an engine failure you should know how to handle the situation. The following points will help to bring the situation under control.

- Find your exact position and inform the local authorities and other vessels in the area of your need for assistance. Make sure you inform them of your exact position.
- Plot the position on a chart and watch for the drift. If you are drifting away from the land make your fishing nets like a rope, fasten the anchor at one end and drop it into the sea. This will help you to minimize the drift and maintain your position closer to your initial position.
- Drop the sea anchor if available.
- Try to repair the engine using existing spare parts if the repair is manageable.

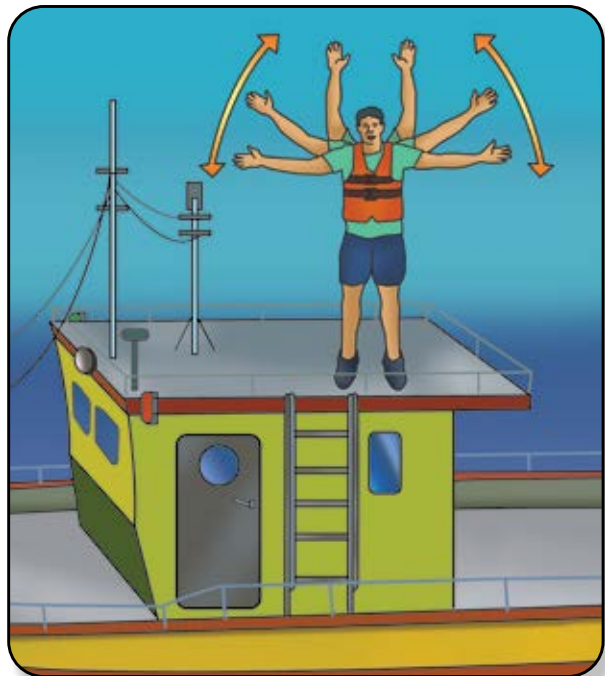
You can give a distress alert through:

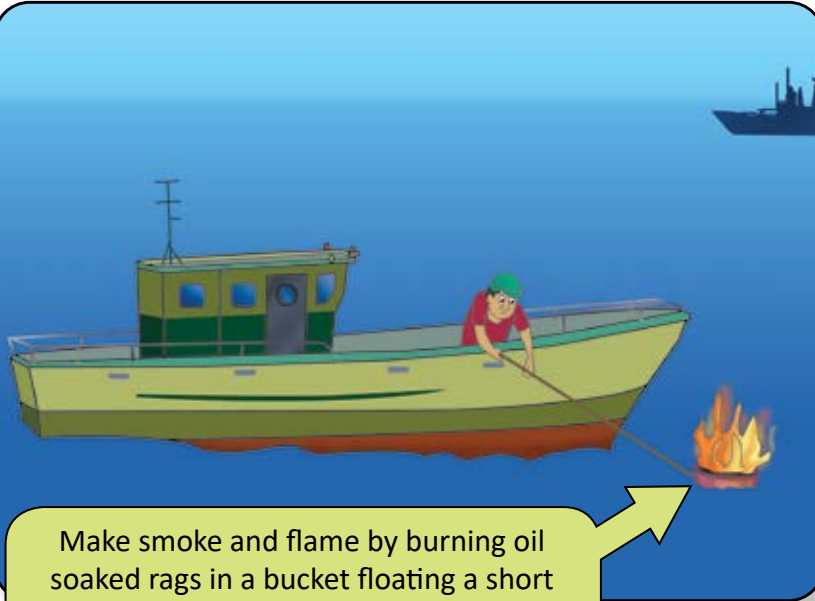
- VHF channel 16 for voice or channel 70 for DSC;
- MF/HF on the frequencies 2 187.5 kHz, 8 414.5 kHz, 4 207.5 kHz, 6 312 kHz, 12 577 kHz or 16 804.5 kHz



- Search for other vessels in the vicinity or closeby who can assist you if the repair is beyond your control.
- Minimize the use of radio to save your battery strength.
- Inform local authorities of your position at least twice a day.
- The skipper should keep the crew strictly under his command and should not panic.
- Let the vessel drift, if the drift is towards the land. Use the sail if available.
- Ration your drinking water and provisions, enabling you to survive at sea for a longer period.
- Do not engage the crew for daily routine work such as maintenance of the vessel and other hard work so they can preserve their body energy.
- Maintain a look out and watch duty in order to find a passing vessel which can help you.
- Send SOS or MAY DAY signals on channel 16 for other vessel's attention if VHF radio is available onboard.
- If you can see a vessel in the vicinity try to get its attention by carrying out the following actions:

Slowly and repeatedly raise and lower your arms outstretched to each side when standing on the top of the wheelhouse or another visible place.





Make smoke and flame by burning oil soaked rags in a bucket floating a short distance away from the vessel on the end of a buoyant line so that the rescue vessel can see your location.



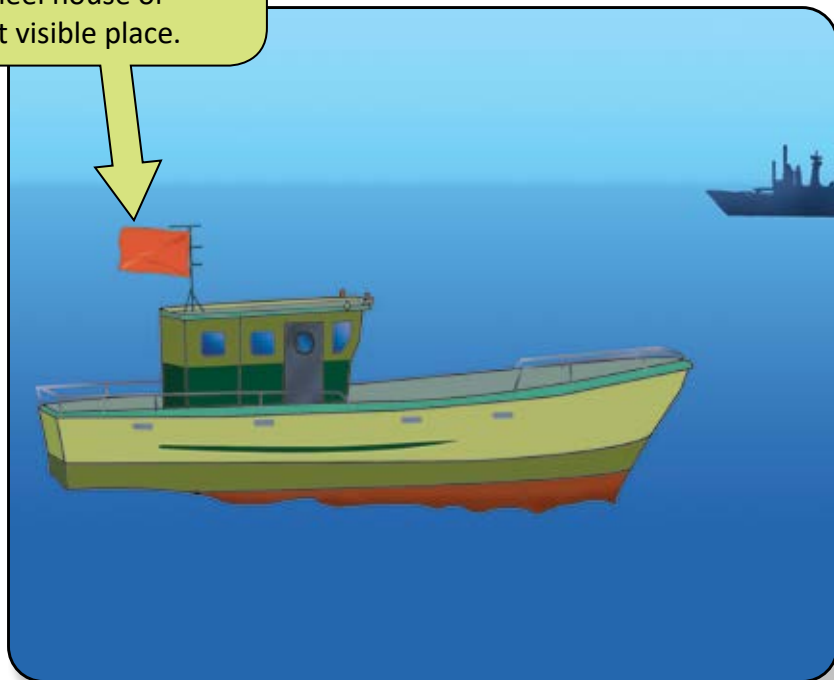
Reflect the sunlight continuously to the approaching vessel using a mirror or any other reflecting object.





Make a group shout to gather attention of the vessel passing by.

Hang a brightly coloured canvas on the wheel house or at the most visible place.



Hang a square flag or a cloth having above or below it a ball or anything resembling a ball.



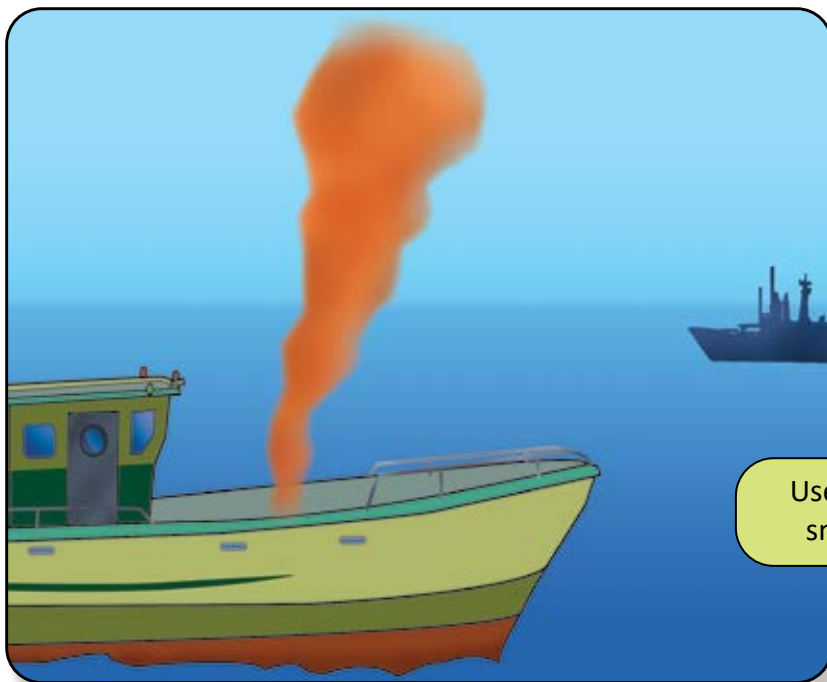
Fire red colour flares if available onboard.



Hang the flag “November” on the mast accompanied with the flag “Charlie”.



Blow your whistle continuously if the approaching vessel is within reach.



Use orange color smoke signals.

Flash your torch or the flash light directly to the wheel house of an approaching vessel.  
Use a signal consisting of the group  
● ● ● — — — ● ● ● (SOS) in the Morse code.



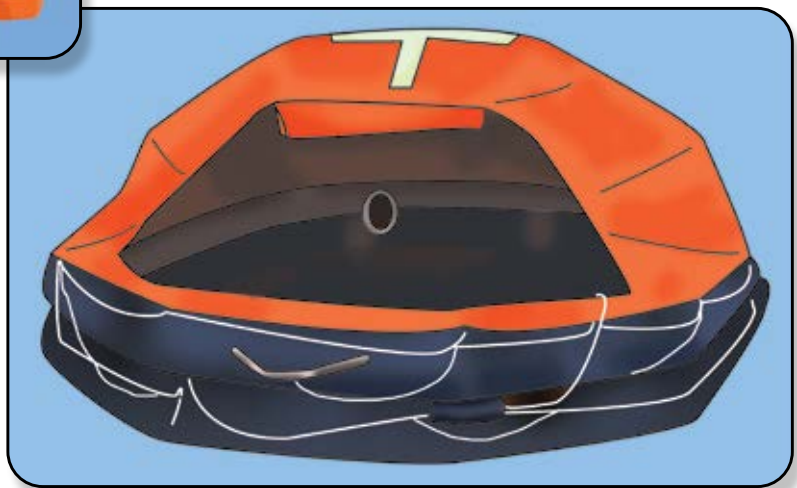
- Do not allow the crew to drink sea water at any time.
- Minimize exposure to sea breeze and sea water.
- Do not drink alcohol or the blood of birds.
- Avoid protein rich foods. It will dehydrate your body. Consume only carbohydrate and glucose rich foods.
- Remember that one liter of fresh water a day is enough for a person to survive in tropical areas.
- Collect rain water in clean containers and store for future use.
- Do not smoke as it tends to dehydrate your body.
- In a desperate situation, you can collect plankton to fight hunger by using a funnel made out of cloth. When you pull the cloth funnel through sea water for some time you can see plankton deposits at the cod end. A sleeve of a shirt can be used for this purpose. Remember that eating plankton or seaweed increases the requirement of fresh water for your body. The spinal fluids of fish also contain fresh water and may safely be sucked out and swallowed.
- Do not expect a quick rescue. It may take a long time. Therefore be patient.
- If another vessel can save only the people, forget about the crippled vessel and save the crew.



## Life rafts and life jackets

Life jackets are essential to have onboard vessels. This equipment could save life in an emergency situation, for example, where a vessel must be abandoned. A life jacket can enable a person to float for a considerable time. However, a long stay in sea water leads to dehydration weakness and a dangerously reduced body temperature. In a desperate situation, a life jacket is helpful to keep a person afloat until a rescue boat arrives.

Many life rafts are available in the market. A life raft should be capable of accommodating the full crew. A life raft is very useful in deep seas enabling crew to survive for weeks or more. In some cases crews have managed to survive in a life raft for 100 days or more until they were sighted and rescued.



## A life raft should include:

- One buoyant rescue quoit (ring), attached to not less than 30 meters buoyant line.
- One safety knife of the non-folding type, with a buoyant handle and lanyard attached and stowed in a pocket on the exterior of the canopy near the point at which the painter is attached to the life raft. In addition, a life raft shall be provided with a second safety knife, which need not be of the non-folding type.
- One buoyant bailer is a requirement for a life raft which is permitted to accommodate not more than 12 persons. However, for a life raft that has the capacity for 13 or more persons, the requirement is two buoyant bailers.
- Two sponges.
- Two approved sea-anchors, each with shock resistant hawser and tripping line, one being spare and the other permanently attached to the life raft in such a way that when the life raft inflates or is waterborne it will cause the life raft to lie oriented to the wind in the most stable manner. The strength of each sea anchor and its hawser and tripping line shall be adequate for all sea conditions. The sea anchor shall be fitted with a swivel at each end of the line and shall be of a type which is unlikely to turn inside out between its shroud lines.
- Two buoyant paddles.
- Three tin openers. Safety knives containing special tin-operator blades are satisfactory for this requirement.
- One approved first-aid kit in a waterproof case capable of being closed tightly after use.
- One whistle or equivalent sound signal.
- Four rocket parachute flares complying with requirements.
- Six hand flares complying with requirements.

- Two buoyant smoke signals complying with requirements.
- One waterproof electric torch suitable for Morse signaling together with one spare set of batteries and one spare bulb in a waterproof container.
- An efficient radar reflector.
- One daylight signaling mirror with instructions on its use for signaling to ships and aircrafts.
- One copy of life-saving signals on a waterproof card or in a waterproof container.
- One set of fishing tackle.
- Food rations totaling not less than 10 000 Kilojoules (approximately 2 390 calories) for each person the life raft is to accommodate; these rations shall be kept in airtight packaging and be stowed in a watertight container.
- Watertight receptacles containing a total of 1.5 litres of fresh water for each person the life raft is to accommodate, of which 0.5 litres per person may be replaced by approved de-salting apparatus capable of producing an equal amount of fresh water in two days.
- One rustproof graduated drinking vessel.
- One drinking cup.
- Six doses of anti-sea-sickness medicine and one sea-sickness bag for each person that the life raft is to accommodate.
- Instructions on how to survive.
- Instructions for immediate action.
- Thermal protective sheets for a minimum of 2 persons.



## Alternate life floats



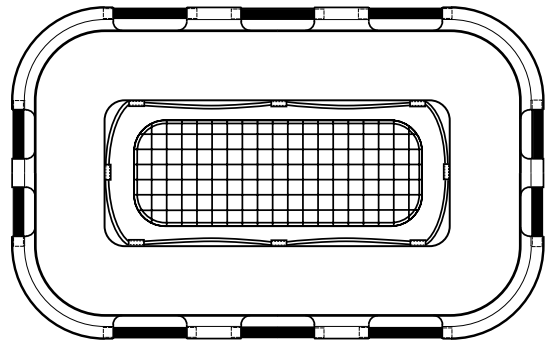
Life belt made from net floats if a lifebuoy is unavailable\*

Fibre-reinforced Plastic (FRP) life float for larger boats as an alternative to an inflatable life raft\*



Life Float | Promoting Safety at Sea of Small-Scale Fisheries | BOBP-IGO

To watch the above video film on Safety at Sea:  
<https://www.youtube.com/watch?v=rzkgAS2VAQ>



- \* Developed under the Government of Bangladesh/ UNDP Project on 'Empowerment of Coastal Fishing Communities Livelihood Security (BGD/97/07)' in Cox's Bazaar, Bangladesh.
- \* Developed under the FAO Technical Cooperation Programme on 'Measures to Reduce Loss of Life During Cyclone (TCP/IND/6712)' in Andhra Pradesh, India.

## Hazards of cold exposure (Survival techniques)

Cooling as a result of exposure to cold water is the most frequent cause of death at sea. Investigations of ship disasters have shown that the risk of dying from exposure to the cold is greater than the risk of drowning.

It is important to know about how to protect yourself against exposure to the cold and how to treat persons who have been exposed to the cold. A person may get incapacitated due to the cold and then he/she may drown as a result. The normal temperature of the human body is approximately 37°C. When the temperature rises to 40-41°C, it results in the person being in a state of delirium. If the temperature falls to 33°C or below, the person will become unconscious. At approximately 25°C, death occurs as the heart cannot beat at temperatures lower than 25°C.

When a person falls into cold water, the water will immediately penetrate the clothes. The insulating layer of air in the clothes will be displaced by water and the skin will be strongly cooled. If the water is below 30°C, the blood vessels of the skin will become narrow in an attempt to preserve heat, however, this action will no longer aid the victim to preserve body heat.

The body will try to produce more heat by tightening the muscles and as a result of this action shivers will occur. If the temperature continues to fall, shivering decreases and the person will no longer feel the cold to such a stronger degree, but will slowly go into a state of unconsciousness.

If a crew-member falls overboard into cold water, the person's limbs will be somewhat frozen and the person may experience paralysis. He/she may be unable to hold on to or grasp any line that may be thrown to him/her for rescue.





If you fall into cold water, you can do the following to survive:

- Try to keep as many parts of your body out of water. Please keep in mind that water cools 5-6 times more than air, even at high wind velocities.
- Don't panic. Try to get control of your breathing, and only shout or make signals to get attention of rescuers.
- If you do not wear a life jacket, then look around if you see anything floating to hold to or climb on.
- If you wear a life jacket, take a position to reduce heat loss, stay as motionless as possible, and keep your head and neck out of the water.
- If you have to swim try to conserve energy and minimize movement.
- Try to stay together if you are with more people in the water.

## Hypothermia

Hypothermia is the condition of low body-core temperature. This results from prolonged heat loss due to immersion in cold water or insufficient clothing or covering when in cold weather, wet and windy conditions. All survivors, especially those in an open craft, are likely to get hypothermia. All survivors should know that hypothermia is a killer. Its onset can be rapid and if not recognized by the victim or other survivors, death is likely to follow within one hour. A victim of hypothermia often does not realize his condition so it is important that you know the signs of hypothermia.

Hypothermia can be identified by:

- Shivering of the body in order to produce more body heat.
- Discomfort, tiredness, poor coordination, numbness, impaired speech; disorientation and mental confusion.
- Sense of touch is poor, speech may be slurred and lips, hands and feet may swell.

The following measures can be taken to treat hypothermia:

- Prevent further heat loss due to evaporation or exposure. Give shelter to the victim from wet and wind conditions.
- Place the victim close to external heat, such as fire.
- Place the victim next to other people for warmth. Huddling together under covers is a faster way to provide the victim with sufficient heat for his/her body.
- Avoid unnecessary physical contact with the person.
- When the victim is conscious, give him/her a warm sweet drink.
- Do not wrap in a blanket unless the air temperature is less than the water temperature or unless the blankets have been preheated. (Unheated blankets insulate the cold surface of the body surface from the source of external heat).
- Do not massage the body or limbs.
- Do not feed solids or liquids to an unconscious survivor.
- Do not give alcohol.

## Immersion foot

Immersion foot can occur when a limb is too long in cold water. The limb becomes chilled and wet, resulting in poor circulation. The affected part is swollen, numb and painful and later the skin may become discolored or broken.

Treatment of immersion foot is as follows:

- Keep the victim warm and make sure that the affected part of the body is elevated.
- Warm the victim's body first, then the limb and do not massage the limb.
- If ulcers or blisters occur, cover them with clean dressings.
- Remove shoes and socks, dry the feet and legs and make movements with the limb.
- Keep the feet in dry clothing material or warm them in the laps of other survivors.

## Sunburn

Crew-members whose duties are outside, such as lookouts, should take care to cover up as much of their skin as possible in order to prevent sunburn. They should keep out of the sun as much as possible. Sunburn is likely to lead to blistering and runs the risk of infection. Sunburn should be treated as a mild burn. Do not prick any blisters but apply antiseptic cream and cover.

## Eye protection

Crew members who spend longer time on the deck should protect their eyes by wearing dark glasses. When the sunlight hits the surface of the water, it is reflected back with a greater intensity. Sunlight in the form of glare can be harmful for your eyes. Polarized lenses offer the best protection while fishing because they cut the glare, which helps avoid eye strain and unnecessary squinting.

## Salt water boils and chafing sores

These are likely to occur when a survivor's skin is saturated with salt water, such as when sitting in water in survival craft or vessel. Skin sodden with salt water is not resistant to infection in small cuts and scratches.

Do not squeeze boils or sores but cover them with antiseptic cream and dressings to heal. Chafing sores are likely to form on buttocks after several days of being on a survival craft or vessel.

## Bodily functions

All survivors should be made to urinate frequently so as to keep the bladder free of urine. If not, it could have serious consequences as the kidneys will continue producing urine. There is no benefit from retaining urine in the bladder, as water cannot be restored from urine into the general circulation.

Survivors should not worry if they become constipated after the first couple of days. There is very little waste residue in the emergency rations of a life raft.

## Dehydration

The human body contains about 40 litres of water, of which approximately 25 litres are needed to maintain life. The normal amount of water lost by a resting person

each day when neither food nor water is taken is about one liter. A person should therefore survive for about two weeks if there is no additional loss of water.

Accelerated water loss can be caused by exertion, sweating, vomiting, diarrhea, drinking urine, drinking sea water, or eating or sucking fish. Exertion should be avoided as far as possible. Particularly in the tropics, sweating should be minimized as far as possible. Vomiting must be avoided by taking seasickness tablets, as vomiting leads to the reduction of water content in the body.

Urine contains poisonous waste materials dissolved in water. These waste products are of no use to the body. **Urine must not be drunk regardless of the desperate nature of the situation.**

Survivors should **not drink seawater as it increases dehydration**, which continues even after consumption. It could therefore prove to be a fatal mistake.

Survivors should **avoid the temptation to use seawater for dry and cracked lips.**

## Delirium and mental disturbance

Delirium is most likely to be caused by drinking seawater. A delirious person will have delusions and may sometimes attempt to jump into the water. It is impossible to reason with a delirious person; restraint may be required. Survivors suffering from exhaustion, injuries, etc. may become irrational or light headed. They should be humoured as much as possible, but carefully watched, for any sudden irrational action.

## Hygiene

Survivors should be urged to keep their skin and mouth clean. The skin is likely to become infected from ingrained salt and dirt and salt covered clothing rubbing against it. If temperature permits, bathing in rain water and brief exposure to sun and fresh air are likely to be beneficial. If bathing, survivors should be attached to the survival craft by lifelines and should not waste energy by swimming about. A look out should be kept for predatory fish.

Survivors are likely to find that their lips and tongues will become swollen and their lips may crack due to the small ration of water and the lack of saliva in the mouth. The inside of the mouth is likely to become furry and foul tasting.



## Conclusions





## Dos and Don'ts (Check-ups and procedures)

### Dos

1. Handover your voyage plan to the harbor authority for their records. It should include important details such as the names and addresses of the crew, boat owner's name and contact details, name and registered number of the boat, area where you expect to carry out fishing operations, expected date of arrival, communication equipment available onboard, etc.
2. Always keep a track of the weather forecast and be vigilant for bad weather.
3. Ensure your safety equipment such as fire extinguishers, life jackets, life rings, life rafts, fire pumps and hoses, position indicating flares and signals, etc. are in good condition.
4. Basic knowledge in fire-fighting, survival at sea and first aid is a must for all crew members.
5. Ensure you have sufficient fuel, fresh water, food provisions and first aid facilities.
6. Spare parts for the engines and machinery, lubricants, tools, etc. must be available onboard to use in an emergency or a break down.
7. Check your SSB or VHF radio, GPS and the echo sounder if available.
8. Check the condition of the batteries and the charging system.
9. Magnetic compass should be checked for deviation and variation. Maintain a record of courses taken.
10. Count prevailing and expected winds and currents when calculating time and speed for the passage.
11. Charts should be available onboard. They should be demarcated with major shipping routes, restricted areas, exclusive economic zones (EEZ) of adjacent countries, etc. Instruments for chart work should be available.
12. Ensure that the engines and machineries are in sound condition so as to avoid encountering troubles when out at sea.



13. Check the outside of the hull carefully for any cracks and damages and inside for leaks.
14. Make sure you have the required identification documents to produce before authorities.
15. Prepare and practice a watch schedule (duty roster) for passages that extend for longer periods of time. It eases stress on the crew.
16. Always try to group with other vessels and try to be in the vicinity of each other. This will help you to get assistance from other vessels in case of an emergency.
17. Inquire about other vessels already engaged in fishing activities out at sea and vessels returning from fishing. Keep track of their movements. It will help you in an emergency and you will be able to predict, up to a certain degree, fishing and the weather conditions.
18. Always plot your position on a chart. Make sure that you update it every hour when at deep sea and every 30 minutes when coasting.
19. Contact the shore radio station at least twice a day and inform them of your position. Gather from them whatever possible information on the weather.
20. Make sure your radio is always listening to channel 16 (and 70 if it has DSC) to quickly call for help and to hear if any other vessel needs your help. Include in

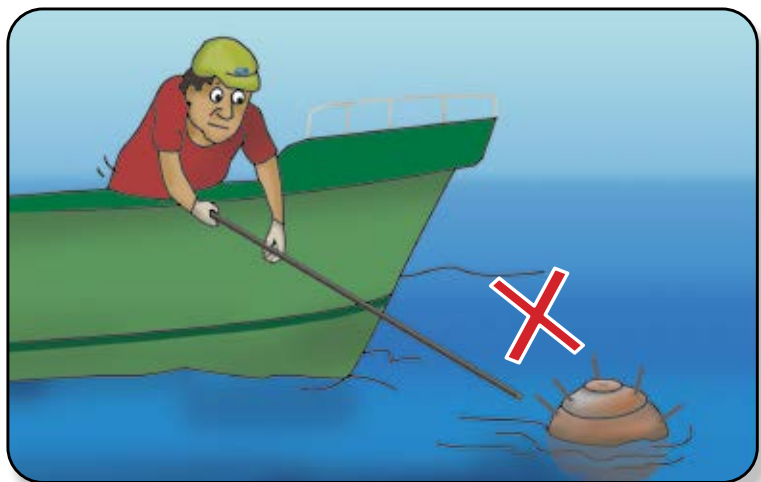


your radio's scanned channels, the agreed working channel with the shore radio station in your country.

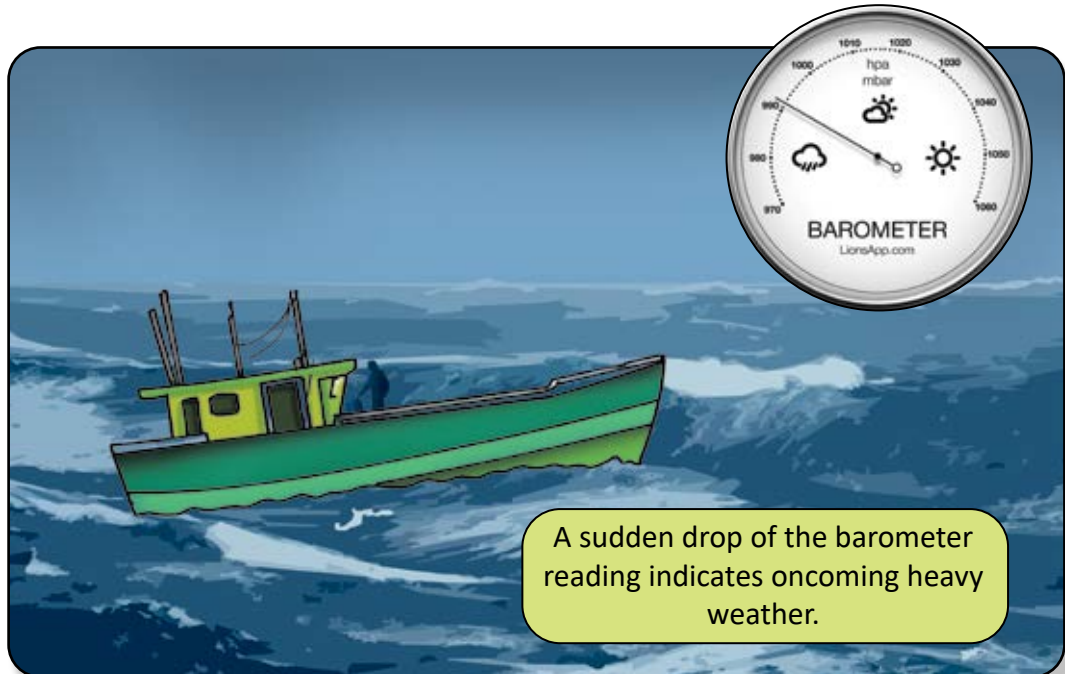
21. Always be vigilant of other vessels coming head-on and crossing your bow. Take necessary precautions in time to avoid collision.
22. Always try to shoot fishing nets and lines with the wind and haul them against the wind. It will help to maintain the vessel behind the nets and lines without drifting on to them.

## Don'ts

1. Do not place metal objects near the magnetic compass. This leads to the development of additional deviation on the compass card, causing considerable errors to occur to your steering course.
2. Do not use radio for unnecessary conversations. Keep the radio free as far as possible for receiving emergency calls from other vessels. This should be strictly adhered to and make sure that the crew-members are aware of the importance of listening.
3. Do not try to lift onboard unidentified objects that are floating in the sea. Such objects could turn out to be sea mines or explosives that could pose a threat to life. This should be reported to the shore base as soon as possible indicating the position.
4. Do not keep fishing gear on the deck while proceeding to the fishing ground and also on way back.
5. Do not go alongside other vessels out at sea unless it is necessary.



## Important points to keep in mind



Always make sure that sufficient spare parts are available onboard prior to sailing. Gland packing and materials to stop any leakage through the hull must be available.



Crew members must report all unsafe conditions to the skipper. It is up to the skipper to correct unsafe conditions as soon as possible.



A first aid kit onboard should contain at least the following items:

| Basic first aid kit  | Essential | Recommended |
|----------------------|-----------|-------------|
| Bandages             | X         |             |
| Band aids            | X         |             |
| Sterile dressings    | X         |             |
| Sterile gauze        | X         |             |
| Adhesive tape        | X         |             |
| Scissors             | X         |             |
| Safety pins          | X         |             |
| Antiseptic cream     | X         |             |
| Tweezers             | X         |             |
| Liquid antiseptic    |           | X           |
| Pain-killing tablets |           | X           |
| Sunscreen            |           | X           |
| Eyewash              |           | X           |
| First aid book       |           | X           |

First aid can make the difference between life and death. Always ensure that your first aid box is well maintained and that all crew-members have practical and up-to-date knowledge and understanding of first aid.

Do not forget to refill the first aid kit when items have been used.

Please ensure that the first aid kit is always placed in a water-tight cover to protect it from water damage.



## Conclusions

FAO and BOBP-IGO hope that this manual on safety at sea for small-scale fishers contributes to a culture of safety awareness, helps to prevent accidents and increases the chances of survival if accidents occur.

This manual provides practical and simple guidance on safety matters related to the work on a small-scale fishing vessel (e.g. fire safety, deck safety), safety equipment (e.g. life saving equipment, lighting and ventilation), personal safety and navigation safety. The manual provides the necessary checks and procedures that fishers should follow before embarking on a fishing trip and advice to increase fishers' survival at sea, in case of accidents.

This manual provides important tips for safe working conditions on a small-scale fishing vessel. At the same time, it is highly recommended that every crew member receives safety-at-sea training with a yearly refresher course.

Such a safety training should preferably include:

- Types of emergencies that can occur, e.g. fire collision, grounding, capsize and injury and procedures to respond to these emergencies.
- The use of a lifejacket, immersion suit (as appropriate) and/or flotation aid.
- The use of fire extinguishers and hoses.
- The use of distress signaling equipment and contact information of all necessary agencies.
- The dangers of alcohol and drugs consumption while on board.
- The basic first aid steps to take in case of an accident.
- Common nautical terms and navigation rules
- The causes and effects of hypothermia, its prevention and treatment.
- The importance of informing harbour managers or fisher association of the crew list and fishing trip details before going to sea.
- Basic safety awareness about the work on board of the vessel.

This manual is not intended as a substitute for national laws and safety regulations and is not a replacement for national level fisheries safety training and capacity building activities. However, it can support safety-at-sea training and awareness of fisherfolk and thus make fishing operations safer.

“Safety first” is what anyone working on a fishing vessel should keep in mind and apply on a daily basis.

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**For more detailed information on safety for small-scale fishing vessels, please have a look at:**

- 1) FAO/ILO/IMO. ***Safety Recommendations for Decked Fishing Vessels of Less than 12 metres in Length and Undecked Fishing Vessels*** available at: <http://www.fao.org/3/i3108e/i3108e.pdf>
- 2) Fisheries operations. ***Best practices to improve safety at sea in the fisheries sector***. FAO Technical Guidelines for Responsible Fisheries. No. 1, Suppl. 3. Rome, available at: <http://www.fao.org/3/a-i4740e.pdf>
- 3) FAO/SIDA/IMO/BOBP-IGO. ***Safety Guide for Small Fishing Boats***. BOBP/REP/112 available at: [http://bobpigo.org/webroot/img/uploaded/pdf/safety\\_guide-rep112.pdf](http://bobpigo.org/webroot/img/uploaded/pdf/safety_guide-rep112.pdf)



This manual on safety at sea for small-scale fishers aims to contribute to a culture of safety awareness among fisherfolk, reduce the number of accidents and increase the chances of survival if accidents occur. The manual provides guidance on safety matters related to the work on a small-scale fishing vessel (*e.g.* fire safety, deck safety, lifesaving equipment, lighting and ventilation), personal safety and navigation safety. Checks and procedures to be performed before a fishing trip, as well as guidance for survival at sea, are also included in this manual.



ISBN 978-92-5-131753-2



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CA5772EN/1/09.19