

The Ultimate Guide to Personal Safety on Ships



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The Ultimate Guide to Personal Safety On board Ships

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About this eBook

While writing this e-book, we have considered that safe practices are not only for engine or deck crew but also for each and every person who boards the ship or sails with the same.

It doesn't matter if you belong to deck, engine, or galley department, when safety of the crew and the ship is at stake, a well planned team effort is what helps to overcome or fight an emergency situation.

For a ship to operate safely at the sea, team effort is of utmost importance. However, the first step towards safety starts with the individual and therefore personal safety is imperative.

In this e-book, you will understand the basics and importance of personal safety along with the right methodology to approach and implement safety in your work on ships. Also find out how as an individual you can stay away from trouble on ship, ensuring not only your own safety but also of the whole ship.

This e-book has been divided into 6 chapters, which cover each and every aspect of personal safety with extensive details.

If you like this eBook, please feel free to share it with your friends.

- Anish Wankhede & Raunek Kantharia

Authors' Acknowledgement

Marine Insight is extremely thankful to all the maritime professionals who have provided their insights for making this book.

We are also grateful to all the chief engineers and captains for the constant support and encouragement they have provided us to write this book.

We would also like to thank all our team members at Marine Insight for working with immense patience and showing great enthusiasm.

Last but not the least; we thank all Marine Insight readers for showing their love and interest, which inspire us each day to deliver our best!

Dedicated

To

Seafarers at the Sea

Salute to all!

Content

1. Why personal safety should be the first priority on ships?

(Page no.: 1 – 24)

2. Personal safety- Your first step on ship

(Page no.: 25 – 50)

3. Personal safety in every part of the ship

(Page no.: 51 – 80)

4. Personal safety in ship's operations

(Page no.: 81 – 126)

5. How to use special personal protective equipment on ships?

(Page no.: 127 – 142)

6. Miscellaneous safety tips & resources

(Page no.: 143 – 156)





Chapter 1

Why personal safety should be the first priority?

- Why safety is so important?
- How to develop the right attitude towards personal safety?
- What all things are included in personal safety?
- What all things you should know before boarding the ship?

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Why Safety at Sea is a Matter of Utmost Importance?

According to the International Maritime Organisation (IMO), “Shipping is perhaps the most international of all the world’s greatest industries and one of the most dangerous.”

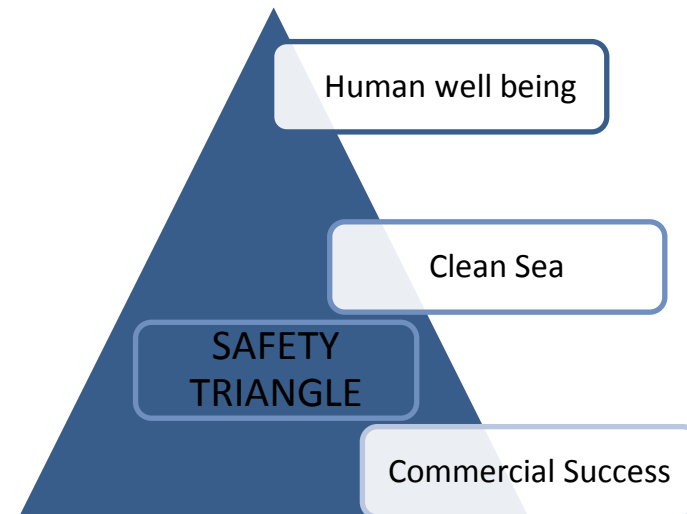
This means that in shipping industry even the most basic job of transporting cargo across oceans involves great amount of risk, involving both physical and financial aspects.

Every part of the shipping business is bounded by stringent regulations, which prompts companies to act in disciplined and organized manner.

To ensure that all operations are carried out in an efficient and smooth manner at the sea, the shipping companies resort to “safety” as their first tool for streamlining processes.

Safety in all types of operations is the key factor in ensuring that the company always maintains its position about the profit line, both efficiently and ethically.

To understand the role and importance of safety in a shipping organization or process, we will take help of the “Safety Triangle.”



Costa Concordia figure

“Carnival Corp., parent company of Costa Cruises, said that the partial sinking of Costa Concordia cruise ship off the coast of Italy could cost it nearly \$100 million in lost earnings”.

When the “Safety Triangle” was compromised in the operation of the Costa Concordia cruise ship, it led to the loss of life, property, and environment.

When a shipping company operates under safety norms, three things (mentioned in the safety triangle) rank at the top of their priority lists:

Personal Safety

Personal safety or safety of life at sea comes at the top of priority list as there is no loss which is considered greater than the loss of human life. Shipping companies understand the importance of the safety of human life at the sea and thus rank it at the very top. It's a known fact that without an efficient crew no shipping company can survive.



Marine Environment Protection

While operating in both domestic and international waters, no shipping company can exclude marine environment protection from its business plan. Safety of marine ecosystem can be ensured by efficient operating conditions on ships to avoid [pollution by oil spills](#), garbage dumping etc.



Commercial Success

Technically, a shipping company can achieve commercial success when the first two aspects of the “safety triangle” are taken care of. An efficient operation of the ship, without any kind of harm to human life or environment saves shipping companies a lot of time, money, and labour, which ensures growth and profitability in return.



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How to Develop the Right Attitude to Attain The Ultimate Personal Safety on Ships?

When we talk about personal safety, it is important to understand that just by providing the right safety equipment to seafarers a safe working environment cannot be created.

You can provide long hours of training and seminars to ensure that the crew knows and understands all the safety features of your ship. However, do note that this would not guarantee a secure working environment.

Unless seafarers realize the importance of safety, hours and hours of training imparted on safe working practices wouldn't bring any results.

So how does one develop the right attitude to attain the ultimate personal safety on ships?

As a seafarer, it is extremely important that the duties onboard ships are performed with an utmost conscious mind in order to avoid any kind of harm to the crew or the ship.

But the attitude to keep an agile mind doesn't come on its own.

Moreover, no one is going to stand by you forever to make sure that all duties are performed articulately along with the right safety measures.

It is only through persistent self motivation and training can a seafarer develop the right attitude towards on board safety.



Every person has a safety conscious mind; however, many a times we avoid safe practices just to get over with the job quickly or are too lazy to follow additional safety procedures. Such attitude needs to be shunned!

**"SAFETY IS A STATE OF MIND — ACCIDENTS ARE
AN ABSENCE OF MIND"**

There is a need to develop safer habits to overcome our "slack attitude" towards safety and to make our working environment safer and secure. Only through consistent practice can one form the right mind set to inculcate safe working procedures.

Ultimate personal safety can be said to have achieved when safe working habits become an integral part of one's reflexes rather than self-initiated actions.

For example, if a ball is thrown at your face, your hands will automatically move to stop the ball. This is known as a reflex action. When such reflexes take form of safe practices and become an inherent part of a seafarer's working behaviour, the ultimate personal safety attitude is said to have achieved.

This natural instinct of a safety conscious mind is the key factor for developing the right attitude in seafarers. Disciplined working procedures and consistent practice are the two aspects which play a major role in achieving the right mind set.

In Box – The 5 Point Personal Safety Checklist

Now we know that a trained mind is the key to achieve an ultimate personal safety environment. Having said that, how do we know our working practices are absolutely safe or not?



You might have undergone rigorous safety trainings and seminars on land; but do note that practicing on shore is one thing and putting what you have learnt in real life scenario on ships is a totally different ball game.

To make sure that you maintain a certain level of safety while working on ship, there is a universal checklist which you need to follow. It is called “The 5 Point Personal Safety Checklist”

To ensure that you take the right course towards personal safety, follow these 5 important checks before carrying out any operation or work on ships:

Awareness of Your Surroundings

Calculation of Risk- Includes surety and suspicion

Work on Risks before Working on the Job

Checking Your Personal Protective Equipment (PPE)

Escape Route

Awareness of Surrounding

The first and most important step towards personal safety on ships is to be aware of your surroundings. Awareness of surroundings includes knowing your working space, risks and hazards present around you, and assessing the amount of efforts the job would require. This would allow you to plan your job safety and efficiently.



Calculation of Risk- Surety Vs Suspicion

After having a complete look of your surroundings, including risks/hazards, check the extent of harm any kind of accident in that particular area can cause you. This is to calculate the amount of risk involved with the work. Always note that the amount of risk involved with any job on ship is always greater than what you would have calculated. Also, if you are suspicious that a particular procedure involved in the job might lead to an unfavourable outcome, stop right there. Make sure you weigh your doubts properly before commencing the job.

Work on Risks before Working on the Job

It is always better to find out the amount of risk involved with the job before getting into it. Eliminate or minimise as many hazards as possible from your working place before carrying out your assigned job. Note that it is not possible to make any job cent percent risk free; however, minimizing the number of risks involved would drastically increase your level of personal safety.



Checking Your Personal Protective Equipment (PPE)



[Personal protective equipment on ships](#) provides you with tools to enhance your safety on board. Ensure that you are using the right personal safety equipment as required by the job. It is also imperative that you know the operation and working of all safety tools on board ships. In emergency situation, these tools are your lifelines, which would get you out safe and secure.

Escape route

Escape route is the last resort you would seek in case all measures to curtail an accident fail.

Note that ships comprise of several machines, pipelines, and complex systems (Pneumatic, hydraulic, electrical, and electronics) running at extremely high working parameters. This makes the ship an extremely hazardous environment to work in.

While working on ship, trouble always comes uninvited and you must be prepared for the same. Sometimes, in spite of following all the safety measures, things might go wrong.

For such situations, always pre-plan your exit-strategy from your working place through the easiest and fastest route possible.



What all things are included in personal safety?

1 Follow Safety Policies: Every company has its own safety policy as per the rules of SOLAS (ISM code). It is imperative that seafarers not only understand and follow these safety points but also put them into practice while working on ships.

2 Situational Awareness: Awareness of any situation involves knowing your surroundings and working environment to analyse the amount of risks involved with a particular job, and to figure out ways to tackle problems, in case any arises.

3 Knowhow and Training: Correct operating knowledge of different equipment tools and systems on ships, including safety procedures and emergency plans must be gained through proper training and practice.

4 Use of PPE: Every person onboard ships must know what personal protective equipment to be used and when. This includes every detail involved with procedure of donning, checking, and operating PPE.



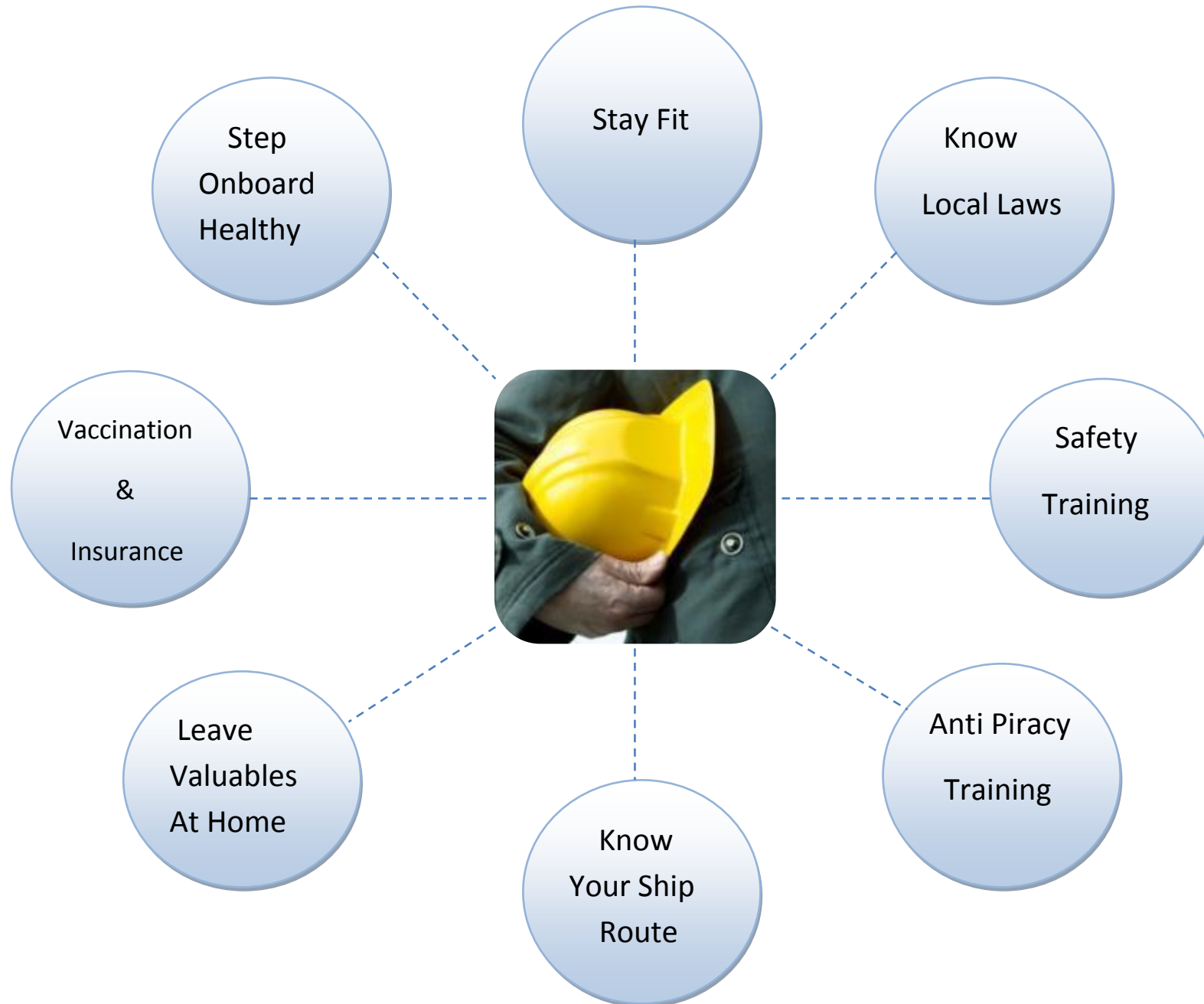
5 Help Yourself First: When you and your colleagues are trapped in a dangerous situation, help yourself first to get out of the situation, and then help others. Don't try to help others unless you are confident about your own wellbeing. This would ensure safety of both you and your colleagues.

6 Know Your Ship Inside-Out: On joining a new ship, seafarers should familiarise with every nook and corner of the ship, including location of fire fighting appliances, life saving appliances, alarms, escape routes, life boats, and everything else that would help them in an emergency situation.

7 Know Your Emergency Duties: Every crew member should know what to do and how to do it in case of an emergency situation. Knowing one's duties would ensure personal safety along with the safety of the crew, the ship, and the environment.

8 Avoid Panic Attacks: It is human to get tensed or nervous in case of an accident. However, one should know ways to control emotions, to maintain mental peace, and to act in a quick and smart manner under the pressure of an emergency situation.

Things to do before boarding a Ship



1. A Fit Seafarer, a Safer Ship – Stay Fit

Make sure you are absolutely fit both physically and mentally before boarding a ship. If you are suffering from any kind of ailment, don't go to the ship without getting it cured.

Remember that there is no specialised medical assistance at the sea, and thus you need to be extra careful as far as your health is concerned. Moreover, if you are required to carry any kind of medication to the ship, inform your company's doctor about your current health condition and take a prescription to carry medicines along with you.



2. Pre-Familiarize Yourself with Local Conditions and Laws

Different countries have different laws and it is imperative to follow all the rules and regulations under those laws. For e.g. pirated DVDs are not allowed at Singapore airport, movies/photographs with explicit content are banned in Gulf countries etc.

These are just a few of the several lesser known laws of different countries around the world. Enquire about the presence of any such law in the countries you are about to visit to avoid trouble on foreign land.

3. Don't Just Attend Training Courses, Get Actively Involved

Training courses and seminars are conducted by companies to make sure that seafarers are thoroughly prepared before joining a ship. Every person joining a ship should pay extra attention to STCW courses and safety training sessions.

Note that extensive information provided during such sessions is not made available again during the whole tenure of one's sailing contract. It is therefore important that a seafarer absorbs and retains maximum knowledge imparted during those sessions to increase his or her level of personal safety on ships.



4. Anti Piracy Training- Need of the Hour

Piracy at sea is at its all-time-high. With hundreds of piracy cases reported every year, the issue has become a matter of grave concern. If the ship you are about to join has its route through one of the piracy sensitive areas, it is imperative that you make yourself aware of ways to tackle pirates at the sea.

In case the company doesn't provide any information, one should personally approach the management of the company and request to arrange for an anti piracy training course or to provide guidelines and knowledge for dealing with such adverse situations.

5. Know the Route of Your Ship

Ask your company about the shipping routes and ports which the newly assigned ship will be visiting during its voyage. This is to get prepared for any kind of adverse weather conditions.

For e.g. you would be required to carry appropriate weather protective gear to save yourself from fierce cold or scorching heat.

The ship is liable to provide all personal protective equipment (PPE) as soon as you board the ship; however, one must carry important weather protecting gears such as parka, muffler etc. to the ships.



6. Keep Valuables at Home

Leave all those things, which you would hate to lose, at home. There are high chances of losing valuable things while travelling or on board ships. Stealing on ships is a common thing especially when the ship is at ports.

7. Get the Necessary Vaccination and Medical Insurance

Check your personal medical insurance papers and get all the necessary vaccinations before boarding a ship. If you have to carry medicines, get the necessary prescriptions as several countries do not allow carrying medicines without perceptions.

Though a company would cover all the medical expenses in case of an accident or ailment, it is always advisable to have your own personal medical insurance to avoid any kind of delay in medical procedures.



8. Know all the points to stay healthy on ships



Personal safety always starts with a healthy body. Few issues are not addressed during safety training and seminars conducted before joining a vessel. A seafarer should gather knowledge on these issues before boarding a ship.

Working on a ship means dealing with adverse climate conditions and hostile working environments. To survive through tough working surrounding, one must stay healthy and fit. Find out how to keep your [mind and body healthy on ships.](#)

Seasickness is a common situation faced by seafarers on ships. One should know about seasickness along with ways to fight the same. Read here to find out [A-Z of seasickness](#).

A seafarer should also have knowledge about other important issues such as:

- ✓ seafarers and the issue of sexually transmitted diseases (STDs)
- ✓ [Stress on ships and ways to avoid it on board ship](#)
- ✓ [Methods to avoid monotony on ship](#)
- ✓ [Harmful effects of drinking seawater](#)
- ✓ [Types of maritime crimes,](#)
- ✓ [Hypothermia and its effects on seafarers](#)



“Ship is like a floating factory full of risk, make sure you are well prepared before boarding it”

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Chapter 2

Personal Safety-Your First Step on Ship



- What all things you need to know the moment you step on board?
- First thing first – checklists
- Developing the right attitude once aboard
- 10 Benefits of acting and behaving responsible

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Things to learn as soon as you step on board ship

A seafarer becomes vigilant about the importance of safety the moment he or she steps on board ship. Every careful step a seafarer takes while climbing the shaky gangway of the ship invokes a kind of realization, which instils the fact that the place he is boarding requires additional awareness to stay safe and secure.

In fact the words “SAFETY FIRST”, stencilled on the bulkhead of the ship in large fonts, would be the first thing anyone would notice as soon as he or she steps on a ship - It is a way of reminding the importance of safety to anyone boarding the ship.

Every operation on ships starts with taking appropriate safety measures. When you join a ship as a new crew member, it is your responsibility to take initiatives to learn about all the safety procedures and features that are important on board ship.

And your first step towards safety starts from your accommodation or cabin itself. Things you should do are:



1. Check your Accommodation

The first place you would visit on board a new ship is the cabin or the accommodation area. Your safety checks start from your cabin. Do the following:

- Check if life jacket and immersion suit are kept in their designated lockers in your cabin.
- Check all fittings, accessories and condition of jacket and suit.
- Check the location of the nearest fire extinguisher from your cabin
- Check the emergency escape located nearest to your cabin
- Check the location of Emergency Escape Breathing Device (EEBD)
- Check your duties posted in the Muster list along with your lifeboat station
- Check the nearest fire hose in the accommodation area
- Check ship's alarm description in the muster list
- Check location of alarm button near to your cabin
- Check your cabin thoroughly for presence of any unidentified object



2. Check the General Layout of your ship

When emergency strikes, time is one thing which is extremely precious. To save maximum amount of time, every seafarer must know the complete layout of the ship, along with the way to reach the muster station from any part of the ship.

Familiarise yourself with the general arrangement plan of your ship by visiting and exploring every accessible corner. Do the following things:

- Check the general layout of your accommodation from each deck
- Check different ways to approach the muster station
- Check forecastle of the ship and arrangements of escape routes provided
- Check location of life raft and lifebuoy provided at the forecastle
- Check aft part of the ship and arrangement of escape routes provided
- Check location of lifebuoys in other parts of the ship

Check Your Work Space

When on ship, a seafarer spends maximum of his or her time at the work place. No matter what your workplace is - deck, engine room, bridge, or galley, ensure that you take every possible precaution to stay safe. Check the following things thoroughly. (Checks for both engine and deck side have been provided)

Engine Room Checks

- Check if life jackets and immersion suits provided in the engine room are in proper condition and well in number
- Check EEBD in the engine room
- Check Medical First Aid Box
- Check emergency escape routes from the engine room and also find out where it leads on the deck
- Check all the life saving appliances for their starting and stopping procedures, including those of emergency generator, lifeboats, emergency compressors, and emergency fire pumps.
- Check all engine room machines for abnormal operations
- Check location of water tight doors and their operation and working
- Check location of fire hoses and fire hydrants

Deck Side Checks

- Check gangway of the ship for proper lifting and lowering arrangement
- Check net and railing in the gangway
- Check all the railings and freeways on the deck
- Check all life saving appliances provided on the deck
- Check location of fire hoses and fire hydrants
- Check location of fire plan
- Check location of international shore coupling and connection
- Check fire line on deck with main valves
- Check the bunker station on deck for remote stopping of pumps.



Bridge Checks

- Check location of lifejackets and immersion suits
- Check EEBD location on bridge
- Check location of lifebuoy
- Check location of nearest fire extinguisher
- Check location for storing EPIRB and SART
- Check location of emergency fire pump switch
- Check location of distress signal button on bridge
- Check emergency escape route from bridge and ways to approach the muster station

Galley Checks

- Check location of the nearest fire extinguisher
- Check location of fire blanket
- Check location of fire alarm button
- Check location of fire damper
- Check location of nearest fire hose
- Check location of nearest escape route and ways to approach muster station from the galley
- Check all electrical plugs and fitting for overheating or burning
- Check all equipment for safe and accidental free operation

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Miscellaneous Checks

Apart from the mentioned places, there are few other important rooms/ sections on the ship which must be checked during the first few days of joining the ship.

Do the following:

- Check fire station on ship and different equipment and systems provided for the same
- Check IMDG locker onboard and safety equipments provided
- Check location of CO2 fixed system on ship
- Check location of chemical locker on ship, along with safety PPEs and material safety data sheet (MSDS)
- Check the location of [SOPEP](#) locker and tools therein



If you are confused about your own decision, you will lose precious time in an emergency situation. Know your ship well.

Checklists and Forms

Every operation conducted on a ship is bounded by a checklist or a form (or both). These tools ensure that no safety measure is overlooked while carrying out a job on ships.

Shipping companies are extremely cautious when it comes to these forms and checklists. It is therefore imperative for every seafarer to learn about these important procedures to enhance their own personal safety.

Technically, there are several of these checklists and forms on ships which are to be referred and filled before carrying out different operations. Each of these procedures should be thoroughly understood for averting any kind of trouble.

To ensure that all necessary steps are taken by seafarers for their personal safety, forms and checklists are filled and filed for later reference.

As soon as a seafarer boards a ship, following forms, checklists, and safety manuals have to be signed.



Forms

Pre Familiarisation Form: Some companies advise their crew to complete a pre familiarisation form within 24 to 48hrs of joining the ship. When signed by the new seafarer, this form is a written proof that an officer of the vessel has provided familiarization of different parts and safety systems of the ship, including muster station, lifeboats, and life raft location.

Department Familiarisation Form: A separate familiarisation form has to be presented by the seafarer within 15 days of joining a ship, in order to validate that he or she has completely understood the safety equipment, procedures, and systems of the ship, including engine room, deck/bridge, and galley. A senior officer is responsible to familiarise the newly joined seafarer with various systems of the ship.

Marpol Declaration Form: Some companies are extra cautious when it comes to marine environment. To prevent any kind of involvement in marine pollution activity, shipping companies ask seafarers to sign a Marpol declaration form, which states that you are aware of all the pollution regulations at sea and are liable to be suspended along with legal actions if any kind of marine pollution results from your mistakes.

Personal Duty Form: A personal duty form is provided to the seafarer stating general duties onboard ship according to the rank, duties to be performed during different emergency situations such as oil spill, fire, grounding etc., and duties at the muster station and assigned lifeboat.



Personal Safety Checklist: A separate safety checklist is provided which states that all safety gears and personal protective equipment (PPE) provided to you are in satisfactory working condition. This form has to be read and signed.

Safety Manual: Ship is also provided with safety management system manuals containing all procedures and operations that are to be carried out in the safest manner. These manuals are also to be read and signed.

Fire Fighting Training Manual: Similar to safety manual, a fire fighting training manual, describing different situations and methods to fight fire safely, is also provided. Operations of different fire fighting appliances (FFA) are also described in this manual. This is to be read and signed.

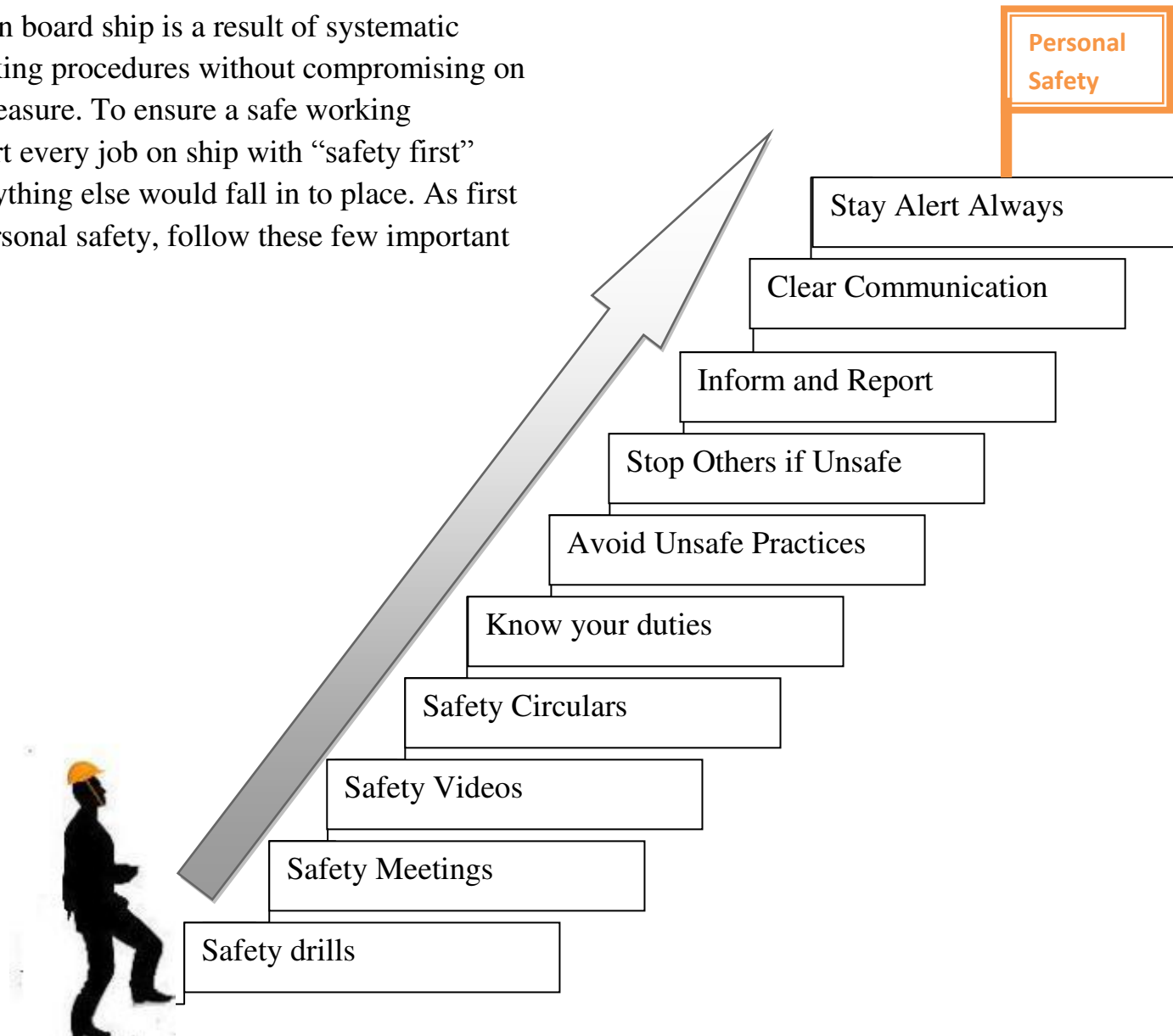


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10 Steps towards Personal Safety On board

Personal safety on board ship is a result of systematic approach to working procedures without compromising on any protective measure. To ensure a safe working environment, start every job on ship with “safety first” attitude and everything else would fall in to place. As first steps towards personal safety, follow these few important points.



1

Do the Drill: Safety drills on various scenarios are performed every fortnight onboard most of the ships. Don't attend these drills as formality, instead get totally involved in them and learn every single step perfectly. During emergency situations, it is your presence of mind, developed through such regular drills, which would work wonders in saving your life.

2

Attend Safety Meetings: Safety meetings are held onboard ships to discuss safety issues and also to enhance the safety of the ship. If you want to discuss on the matter of ship's safety, no matter how small the issue is, report it to your colleagues during these meetings and avoid any kind of accident at a later stage.

3

Watch Safety Videos: There is nothing better than to get trained by visual and audio medium, which simulates a difficult-to-handle situation. Information attained from such videos is easy to retain and to apply in real life scenarios.

4

Follow Safety Circulars: Keep a regular track of safety circulars sent to the ship from the P& I club or your company to know about different risks, tips to tackle them, and other technical information. Circulars are good source of information on new safety technologies and amendments introduced in the shipping industry.

5

Clear Communication: In case you have doubts while performing any job on ship, don't keep it to yourself but consult them with fellow mates or seniors. A clear communication with team members ensures smooth and efficient performance.

6

Inform and Report: If you come across any suspicious thing, which can be a threat to ship's safety, inform/report it to the duty officer or seniors. Trouble detected in early stages can be easily tackled or reduced in intensity.

7

Stay Alert: Don't be lazy when onboard. Stay alert at all the places - Engine room, deck, galley, cabin, or any part of the ship. Emergency can strike at any time, and especially when one is least bothered about the same. An alert mind can save several lives and prevent a lot of damage.

8

Say No to Unsafe Practices: If your superior or co-worker asks you to do a job, which compromises your personal safety in any way, refuse the job politely and work towards eliminating the risks first.

9

Stop Others Compromising Safety: Follow your SAFETY FIRST rule to warn others compromising personal safety. Sometimes you may land in trouble because of mistake done by your colleagues. It is therefore every seafarer's duty to stop any one following incorrect safety practices on ship.

10

Know your duties: Know your duties inside-out; these would solve most of the problems. Also, make sure you know and remember your assigned duties for emergency situations. This would avoid a lot of confusion and eventually increase the level of safety on board ship.



“The Best Safety Device is a **Safe Worker**”



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8 Benefits of Responsible Behaviour On board Ships

Responsible behaviour on board ship has several benefits. It not only ensures your personal safety but also enhances your overall job performance. Some of the main benefits of acting responsible with safety attitude are:



Protection against occupational hazards



Better Decision Making



Ensures Smooth and Safe operation



Better Interpersonal Work Relationship



Ship and Crew Protection



Creates a Good Impression



Saves Time, Efforts, and Money



Ensures a Safe Journey

Protection against occupational hazards

The most important benefit of personal safety is that it gives utmost protection against work related risks or occupational hazards onboard ship.

Ship operations are always attached with some form of dangers. A systematic approach towards work, along with safe practices, can work wonders towards reducing the risk factor.



Ensures Smooth and Safe operation

Any work carried out on ship after following all safety procedures has least chances of failure or facing hurdles. This results in smooth operation of the concerned machinery and also of the overall ship.

Ship and Crew Protection

A single mistake by a crew member can put the safety of the whole ship at stake. Thus taking all measures to ensure personal safety eventually leads to a safer ship and enhance crew protection.



Saves Time, Efforts, and Money

Following safe procedures while doing work on ship prevents any kind of breakdown or hurdle in operations. This ensures a smoother process, saving time, efforts, and money.



Better Decision Making

When you work along with necessary safety gears and follow all safe operating procedures, the chances of meeting with an accident are rare. This drastically reduces work related stress, enabling you to take better decisions and avoiding mistakes.

Better Interpersonal Work Relationship

When colleagues and seniors on ship realize that you are a person with safety conscious approach towards work, they will always be ready to work with you. This would improve both professional and personal relationships on ship.



Creates a Good Impression



Having a safety first attitude always creates a good impression on superiors and ship management. Such responsible behaviour will always be an added advantage while assessing your performance report. Moreover, people with the right safety attitude are always considered as valuable assets for the ship and the company.

Ensures a Safe Journey

Last but not the least, a mind with the right approach towards safety ensures a safe, hassle-free sea contract by avoiding unsafe practices and unnecessary hurdles.



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Chapter 3

Personal safety in every part of the ship

- Engine room
- Deck
- Accommodation
- Galley
- Workshop
- Cargo Hold

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Personal Safety in Engine Room

Engine room is considered one of the most hazardous areas on the ship. With several machines running amidst an hostile environment, having inflammable oils, extremely hot water, high temperature steam, and elevated parameters such as RPM, temperature, pressure etc., an engine room is a dangerous place to work in.

To survive in the hostile environment of the engine room one needs to strike a proper balance between personal safety and good seamanship, not to forget the skills necessary to handle a machinery. A smooth and efficient engine room process can be achieved when one keeps some important safety points in mind while working.

Following hazards or risks are always present in the engine room and one must be aware of them in order to take necessary precautions to ensure personal safety.



- The most common risk in the engine room is of slipping, tripping, or falling because of small, confined spaces and high elevated staircases, which are designed in such a way to compensate for machinery spaces.

Always be careful while walking through such areas. Remember to hold the railing with one hand when using stairs. Also, be extra careful if oil or any other slippery material is on the floor.

- Always wear safety gears provided to you, especially safety helmet when working in the engine room (Ship professionals often avoid helmets in the engine room because of high temperature).
- There would always be hazards from machines running at high RPM, along with other elevated parameters. Always be careful of them and start work on any machinery only after it is fully isolated and after necessary permits are taken.
- As mentioned earlier, because of abundance of oil (lube and fuel) in the engine room, the chances of slipping and tripping are high. Thus, always keep an eye on oil leaks and maintain good housekeeping in the engine room.



- Never lean or put your weight on floor railings as it may lead to tripping and falling from heights. Always use safety harness while working at heights.
- Do not run in the engine room as confined spaces are fitted with several pipes and protruding structures. Even during emergency alarm, maintain your calm and walk carefully. It is better to reach your point safely rather than not reaching there at all because of an accident on the way.

- Never Smoke in the engine room. It is one of the most common causes of fire.
- Be careful when working on steam systems as pressurised steam can lead to scalding (burning). Never touch fuel or steam pipes with bare hands.
- Make sure that insulation lagging is always present on steam and fuel piping systems, and is completely dry. Presence of oil on or under the surface can lead to fire.
- While beginning your routine know when the ship is in UMS mode, and make sure you activate the dead man alarm in the [UMS control system](#).



- Never lift heavy load alone. Assess the load of the object and your lifting capacity.
- Never ignore any abnormality in the machinery. Always check, report and repair.
- Know all emergency operations and safety procedures.
- Make sure you take all the precautions necessary before working on electrical systems to avoid electrical shock hazard.

Personal Safety on Deck

The deck of the ship is the most highly accessed area on the ship by both ship's crew (on duty and off duty) and visitors. It is therefore also the highest accidental prone area of the ship.

When on deck, there are several hazards one should be aware of. Keep in mind below mentioned points in order to avoid accidents on ship's deck.



- The deck area is exposed to open weather and thus water or moisture is always present on the surface. Make sure you walk carefully to avoid slips, trips, or falls. Also wear the necessary personal protective equipment (PPE) and hold railings when moving on the open deck.
- Also be careful of pipings and other deck fittings which may lead to trips and falls.



- Most of the deck machines operate heavy and high tensioned loads. Make sure you are well aware of the deck machinery, along with the safety precautions and operation.
- When on port, keep an eye on the port's gantry, crane, and any connected pipes. Also, never walk under lifted cargo or crane grap.
- At port, several items are loaded or unloaded by the ship's crane. Take all due precautions while working on the deck and never walk under lifted loads.
- Know the location of the nearest fire extinguisher in forepeak and aftpeak of the ship.



- Know the location of life buoys and liferafts on the deck.
- When ship is at the sea, always inform someone before coming out on the deck alone, even during off duty hours.
- Never come out on the deck during rough weather.
- When working at fore or aft part of the ship, beware of ropes, chains and machines, especially when they are under operation in ports.
- Never lean on the ship's side or on the side railings.

- When using the gangway, make sure railings and safety net are provided.
- Know the location of international shore connection, fire plan, fire hydrant, and hoses on the deck.
- On tanker ships, take all due precautions to fight hazardous atmosphere on deck when in port.
- Know the location of IMDG containers and their specifications including emergency procedure provided with IMDG certificate in container ships.



- When working at heights such as on mast or bridge area, always wear safety harness.
- When setting up the gangway in port, always wear safety harness and life jacket.
- If you are climbing or using pilot ladder, make sure you use a 3 point contact to avoid a fall.
- Always use all necessary personal protective equipment (PPEs) and work in team.

Personal Safety in Accommodation

The accommodation area on the ship is where the crew members' cabins are located, along with galley, recreational room, meeting room, library etc. The accommodation area of the ship is extremely vulnerable to fire as it comprises of wood, cardboard, and other fire-sensitive substances .

In order to avoid fire or any other type of accident in the accommodation area of the ship, remember the following points.



- Make sure your room is clean and hygienic to keep it disease-free.
- Ensure that the access door of your cabin has only inside locking system i.e. there is no additional latch outside the door. Moreover, make sure that the locking system facilitates you to go outside the room even when the door is locked from outside.

- Ensure that your port hole rubber gasket and hinges are working correctly and have required water tightness property to avoid ingress of water in bad or heavy weather.
- Do not smoke cigarette sitting or lying on the bed and do not keep or throw live smoking buds in the dust bins.
- Try not to use essence stick or candles inside the cabins. If they are used, make sure they are lit up during your presence and blown off when you leave the cabin.
- Never use hot plate or heater for cooking purpose inside your cabin.



- Never use loose or open wire (without plug or naked wire) in the cabin.
- Always make sure that electrical circuit is never overloaded i.e. too many connection are put in one socket.
- Never put your clothes near or on room heater or lamps.
- Do not bring in the cabin oily rags inside your boiler suit pocket
- Never leave iron unattended when ironing clothes in laundry room.

- Always make sure all the electrical circuits in accommodation area are in sound condition to avoid short circuit fire.
- Chief cook should make sure that galley is always attended when hot plate is on.
- Never leave oil pan unattended in galley.
- Toaster and kettle must never be over heated.
- If any welding or gas cutting operation is carried out inside accommodation, all the precaution that are necessary must be taken.
- In tanker ships, accommodation ventilation suction should be away from cargo holds as cargo vapour can enter inside the accommodation area and create a flammable atmosphere.



Personal Safety in Galley

As ship's galley is the place where food is cooked for the crew, good housekeeping and sanitation are primary concerns in this department.

The galley is always at risk of fire because of hot plate, live electrical appliances, and usage of cooking oil at all working hours. The catering staffs, which are very limited –chief cook and steward, must observe the following to enhance personal safety in the galley



- Always maintain hygiene and cleanliness in the galley
- Wear apron and other safety clothing when working in the galley
- Secure all utensils and sharp objects (knife, fork etc) when not in use as rolling and pitching of the ship may lead to accident

- Emergency escape must always be clear and marked
- Take precaution when using hot water and oil for scalding
- Never overload any plug or circuit.
- Make sure you know the location and operation of extinguisher in the galley
- Know the location for operating fire flaps of the galley



- Make sure there are no insects and pests in the galley
- Be careful when working on hotplate, especially with cooking oil
- Be alert when using electrical appliances. Ensure that their wires and other required parts are properly insulated and there is no risk of electric shock.
- Use proper insulated gloves /oven gloves when handling hot utensils.

Personal Safety in Workshops

A ship is mainly provided with two workshops, one on the deck and other in the engine room. Both these workshops are equipped with a variety of machine tools such as lathe, drills, millers, grinders etc., which are required for repair and fabrication operations performed on board ships. Because of the high number of tools present in the areas, these workshops are considered risky areas where personal safety is of utmost importance.

Following precautions must be taken by any person using ship's workshop to ensure his or her personal safety



- Always wear proper personal protective equipment before performing any operation in workshop.
- Make sure you know how to safely operate the machinery and equipment of the workshop.
- Know the correct tools required for each machine in the workshop
- If you are not familiarised with any machinery, ask your seniors for assistance.

- Make sure machine guards are always in place.
- Perform one job at a time and never distract any person operating an equipment in the workshop
- Avoid loose boiler suits and belongings such as chains and finger rings
- Avoid long hair or tie them while working
- Always wear eye protection in workshop as this is the place for welding, bracing, scrapping etc.
- Know the nearest fire fighting extinguisher
- Know the escape route from the workshop
- Report all damaged equipment and tools, and avoid using them
- Keep the workshop clean and dry
- Report all hazardous and unsafe condition in the workshop
- Always shutdown all equipment and machines in workshop after use



Personal Safety in Cargo Hold

A cargo hold is the place where the cargo is stored on the ship. Such huge amount of cargo stored at one place requires regular inspection and maintenance. A cargo hold of a dry ship (bulk carrier, container etc) is a massive area enclosed by doors on top, whereas cargo hold of wet ships (oil tankers, gas carriers etc) is in the form of integrated tanks with small openings and piping connections for cargo transfer.

It is therefore very important to maintain a high level of safety when entering a cargo hold for inspection or maintenance operation. The following points must be followed



- Inform your department about your visit to the cargo hold before entering
- Always try to enter the hold in company or with one person standing by at the entrance of the hold
- Ensure that you are wearing necessary PPEs and the communication gear (walkie-talkie) is working properly
- When entering a dry ship cargo hold (container/bulk carrier etc.), ensure that it is well ventilated and the blowers for that hold are running continuously.

- When entering tanker cargo hold (oil tanker/gas tanker), ensure the hold is empty, gas free, and checked by superiors for hydrocarbons, oxygen etc. Also make sure it is certified as safe to entry by the management of the ship.
- When entering in a tank through small hatch or opening, ensure the hatch is properly secured and does not shut down accidentally.
- Ensure you are carrying approved lights and torches prior to entry
- When getting down in the hold with stairs, ensure a 3 point contact.
- If inside the container hold, do not go in-between the container racks when the ship is sailing.
- For all operations inside the hold (cleaning, welding, hot work painting etc.) take prior approval and fill the necessary checklists.



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Chapter 4

Personal safety in ship's operations



- Machinery Maintenance
- Cargo Operation
- Mooring Operation
- Lifting Loads
- Crane Operation
- Working Aloft
- Enclosed Space Entry
- Cleaning & Painting Process
- Bunkering
- Handling Chemicals

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Personal Safety During Machinery Maintenance

To ensure that cargo reaches safely and efficiently from one port to other, a ship is equipped with a number of machinery both in the ship's engine room and on deck. For a smooth sail it is very important to maintain all the machines at regular interval of time.

It is the job of a ship's engineer to perform conditional or breakdown maintenance on ship's machinery while keeping in mind that personal safety is of the highest priority.

Each machinery and equipment will have specific safe working and maintenance procedures, which must be well known to the person who is working on that particular system. Manuals and risk assessments must be followed before performing any kind of maintenance on ships.

Following safety precautions must be taken care of when working or maintaining ship machinery:



- Always use all necessary personal protective equipment while doing maintenance work on machinery
- Fill risk assessment forms and insist for tool box meeting to understand the requirement and procedure of maintenance
- Make sure the machinery is taken off the power by tripping off the breaker

- Ensure all required valves and lines are closed for the maintenance work
- Never wear loose overall, jewellery etc. when working on the machinery
- Tie long hair when working on machinery
- Never carry out a job when you are not sure about the safety procedure.
- Try to work in pair and use ply cards/warning signs/notice wherever required.



- Always use proper tools for the job. Never try to use different tools (undersize or oversize) for performing maintenance job.
- Always check the tool for any damage- hydraulic tools (e.g. hydraulic jack), load lifting tools (e.g. chain block or crane) etc.
- Never do your work in hurry, take time to follow all safety procedures.

Personal Safety while Cargo Handling

A commercial ship is a link in the “trade route” of distant points. Goods flowing in the route must be transferred efficiently to and from the sea links. These goods must also be given utmost care while on the ship, and should be made sure that they are not hazard to the ship and its crew.

The ship’s crew should always remember that whatever they do, the main aim under all circumstances must be – ‘Safety First’.

During cargo handling operations following points are to be remembered to ensure utmost personal safety:



- Personal protective equipment must be worn during cargo operation which includes safety shoes, safety helmet, overall, gloves, etc.
- While handling ongoing cargo operation, be careful not to come in the way or stand under any heavy load
- Safety of the personnel involves [correct lashing procedure](#) to avoid back injuries and sprains
- The lashing bridge and catwalks must be in safe condition for work.

- All the lashing bars and lashing equipment must be in place and not be left lying on the lashing bridge floor
- One must never stand or walk under a working spreader or port crane. The consequences could be fatal if an accident occurs
- Safety signs should be posted at appropriate places (For example 'No Smoking' signs)
- The deck and even the cargo holds should be free from oil or greasy materials. If the deck is found oily, it must be cleaned up immediately
- Cargo holds containing dangerous cargo or fumigated containers should be well ventilated. Entry into such a hold with inadequate ventilation must not be allowed
- Emergency exits and escape routes must be clear off of all obstructions at all time.



Personal safety in Mooring operation

There have been several cases reported in the past about accidents occurring during ship's mooring operation, which has led to severe damage of the ship and even death of seafarers.

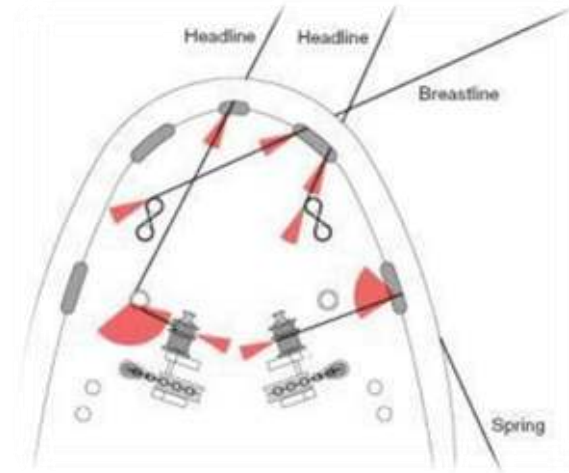
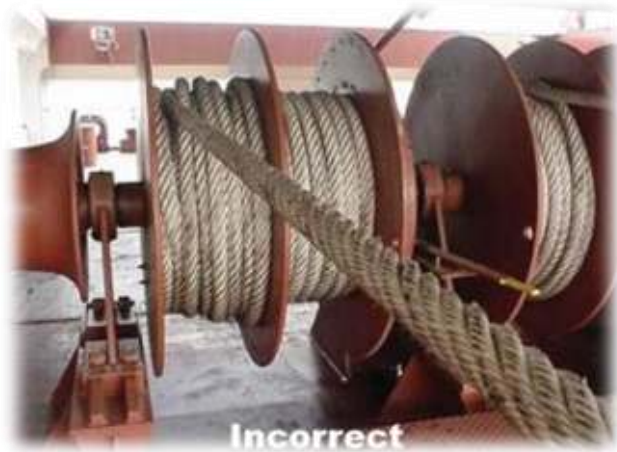
The mooring areas on a ship comprises of forward and aft parts of a vessel where winches are installed to pull the ropes from tug and jetty bollards. The mooring area is equipped with several equipment and systems such as winches, hydraulic motors, bollards, piping valves, anchor chain etc.

Following factors make the mooring area and operation dangerous:



- Use of old and damaged wires and ropes
- Unclear mooring area with unused ropes and equipment
- Mooring ropes are not fastened but stored at winch drum end
- [Mooring equipment](#) are not maintained properly
- Undersized and untrained operating staff
- Supervisor of operation is involved with some other work as a result of less crew members

- The painting of mooring area is badly planned, with all surfaces and equipment painted with same colour, not highlighting hazardous and tripping sights
- Over painting of drum including corners, causing rope damage
- No warning marks painted
- Non slip deck is not available
- Personal Protective Equipment are not used



- Rope and metal line are joined directly without using thimble which may lead to parting of ropes
- Inspection and tests of mooring machinery and ropes are not carried regularly
- Ropes are not arranged on split type drum correctly. The smaller drum must have 4-5 turns and rest of it should be on larger drum
- Crew not aware of Snap Back Zone
- Crew not aware of dangers of rope bight

Know Snap back and rope bight in detail [here](#)

Personal Safety while Lifting Weights

When it comes to human body, the spinal bone holds utmost importance. Back bone is a critical part of our body structure as it is responsible for our physical movements and for giving our body a proper shape and form.

Back injury or back pain is the most common but neglected problem experienced by all ships' crew. One of the reasons for this problem is the amount of physical activities involved in a ship's operation, which even includes lifting of heavy loads by the crew member.

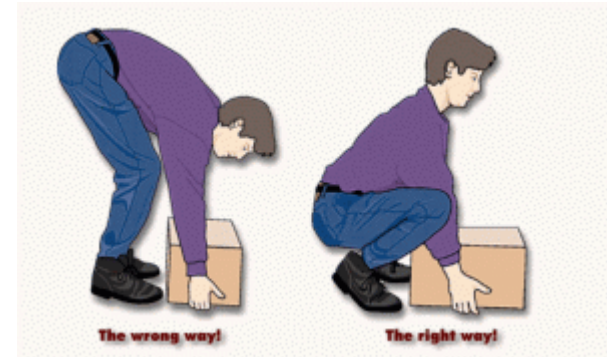
In order to avoid such problem and its long term consequences, it is very important to understand and train the personnel onboard for correct lifting techniques as once a back problem occurs; the chances of its prolongation are extremely high.

Following are some basic rules that need to be applied while performing a physical lifting task on board ship:



- Always warm up your body before lifting any kind of load involving stretching of muscular parts.
- Check the size and weight of the load. If it's out of your strength call for help and never lift the load alone.
- Check the surroundings and the course for any hurdles and skidding surface, where the load is to be carried and transferred

- Put your steps on a level floor and take firm stance to place your legs apart from each other with one leg behind the other
- Sit with bended knees to lift the load
- Wrap one entire arm over the object and other in appropriate position to lift the load
- Keep you back straight nearly vertical and chin tuck inside



- Be as much close to the load and the start lifting the load with your foot and knees. Do not use your back for this task
- Lift the load smoothly and slowly to avoid sudden and jerky motion
- Never twist your body to change direction, always turn the whole body together
- Always ask for help when needed and be careful when using stairs

Personal safety is of utmost importance on ships. It is something that has to be taken care of by each person working on board ships. The bottom line is stay careful, lift safely, and use proper lifting procedure.

Personnel safety in Crane Operation

Cranes are an important part of ship's operation. Cranes include cargo, general stores, and equipment handling cranes at both deck and engine room. Every ship consists of some or the other type of crane such as cargo crane, engine and ship store crane, engine room overhead crane etc., which are to be used and operated by the ship's staff.

Personal safety for crane can be divided in two important parts-

- 1) When working on the crane i.e. operating the crane
- 2) When assisting the crane operation i.e. working in the vicinity of operated ports or ship's crane

The crane operation must be carried out under the supervision of senior officers along with proper planning.



Personal safety when operating the crane

- Know the Crane Dimensions i.e. total lift, boom specifications etc.
- Wear a hard hat and safety glasses during crane operation.
- Know the crane capacity i.e. SWL – Safe Working Load and never exceed the specified SWL.
- Know the emergency stop button of the crane.

- Always inspect the crane operation area before using the crane. It must be clear off any obstacles
- Pre check the complete operation controls before handling loads
- When operating the Cargo Crane, always have assistance on deck to streamline the operation of loading/unloading
- Determine the safest location from where to operate



- Know the basics of required parameters in the crane system i.e. temperature, pressure etc.
- Determine the safest route and destination of loads.
- Review both universal and site-specific crane signals for lifts.
- Ensure that the load is tied at the centre of gravity with strong rigging and lashing equipment.
- Never leave a suspended load unattended.

Crane operation should always be carried out in assistance of other co-workers. If you are one of them, who is standing near the crane or in the vicinity of the operation, follow the personal safety as stated:

- Always wear complete personal protective equipment (PPE) especially the hard hat
- Never walk or stand below the lifted load
- Know both universal and site-specific crane signals for lifts
- Know the crane capacity i.e. SWL – Safe Working Load and never allow the operator to exceed the specified SWL
- Keep an eye on the wire of the crane and the lifted load
- If the load has to be hand handled to provide direction or to avoid load swing, keep well clear from the body and use rope to hold the load
- When tying load to the crane, ensure that the lashed equipment is of correct strength and that the load does not slip out

- Always wear gloves to avoid direct contact with steel rope
- Know the emergency stop of the crane
- Keep clear from the hydraulic system of the crane when under operation
- Make sure no one comes below the lifting load
- Inform the operator if you see any abnormality



Personal Safety When Working Aloft

Sometimes while doing ship maintenance, the crew has to work well above the ground level. There have been several incidences reported of crew members falling from heights, bosun's chair, portable stairs, mast, and other heightened places.

It is therefore extremely important to take care of personal safety when working aloft inboard or outboard the vessel. Note the following important points while working aloft:



- Always wear all personal protective equipment
- Check and wear safety harness and fall arresting gears
- Always inspect and test all ropes, whether a safety lifeline, gantline, or stage rope
- Use a Jacob's ladder, gangway, or accommodation ladder to reach or to lower from the work platform. Never “ride the hoist” or use rope to reach the work area
- Inform the mate on watch for the need to go aloft, stating the nature of the work involved

- The climber shall hook into the fall-arrest rail at a strong point and remain attached to it at all times when aloft.
- Do not take extra weight with you. Tools and stores can be sent up or lowered by line in suitable containers. Instead wear a tool belt.
- When using a chair for riding topping lifts or stays, make sure that the bow of the shackle, and not the pin, rides on the wire



- If working on mast, radar or any other devices energised by electrical supply, make sure the device is switched off and “Do Not Energize, Person Working Aloft” ply card has been displayed
- If you have to work on portable ladder, make sure it rests on a firm base and is secured as close as possible to its upper resting place
- Do not lean away or too far from the portable or pilot ladder
- Always ensure 3 point contact with portable ladder
- If working aloft near the funnel or whistle, ensure that bridge and engine room are informed about the same

Personnel safety in Enclosed Space

A ship is a complex structure which comprises of several small and enclosed spaces. Many of these enclosed spaces are used for accommodating machinery or storing machine parts and workshop equipment. A ship also has a matrix of pipelines that runs through each of its parts, including enclosed spaces.

Because of zero ventilation, these enclosed places have harmful toxic gases which are either produced from chemicals stored in the place or from leakages in the pipelines. If a person enters such place without taking necessary precaution, he or she may suffer unconsciousness or sometimes even death.

In order to prevent any kind of unfortunate circumstance, there is a proper procedure that needs to be followed for safety and wellness of the person entering the enclosed space. The procedure is as follows:



- Risk assessment to be carried out by a competent officer as enclosed or confined space entry is deficient in oxygen and is a potential life hazard
- Potential hazards are to be identified such as presence of toxic gases
- The confined space has to be well ventilated before entering

- All fire hazard possibilities should be minimized if hot work is to be carried out. This can be done by emptying the [fuel tank](#) or chemical tank nearby the place of hot work
- The enclosed space has to be checked for oxygen content and other gas content with the help of oxygen analyzer and gas detector.
- The oxygen content should read 20% by volume. Percentage less than that is not acceptable and more time for ventilation should be given in such circumstances.
- Enough lighting and illumination should be present in the enclosed space before entering.



- A proper permit to work has to be filled out and checklist is to be completed so as to prevent any accident that can endanger life.
- Men at work sign boards should be provided at required places so that no other person starts any equipment, machinery, or an operation in the confined space, risking the life of the people working in it
- Duty officer has to be informed before entering the enclosed space

- One person should always be at the standby position, outside the enclosed space to communicate with the person inside the space and keep checking the oxygen content.
- Carry oxygen analyzer inside the enclosed space and the oxygen level should be monitored all the time. As soon as the level drops, the analyzer should sound the alarm and the space should be evacuated immediately without any delay
- No source of ignition should be taken inside unless the master or competent officer orders to take one along
- The number of persons entering the enclosed space should be constrained to the adequate number of persons who are actually needed inside for the work.
- The rescue and resuscitation equipment are to be present outside the confined space. Rescue equipment includes breathing air apparatus and spare charge bottles
- Means of hoisting an incapacitated person should be available
- After the work is finished and when the person is out of the enclosed space, the after work checklist has to be filled



Personal Safety while Cleaning & Painting Operations on Ship

Cleaning and painting are important part of maintenance work on ships. The long life of the ship not only depends on the efficiency of the machines but also on cleaning and painting of different parts which are exposed to harsh environment of the sea.

The ship structure is also coated with anti corrosive paint and other types of special coatings for areas such as hull and cargo holds, which are always in contact with sea water or liquid cargo.

Maintenance work also includes removing of old paint and applying a new coat at regular interval of time. This process requires operations such as chipping, scrapping, wire brushing etc. A person involved in such operation must consider his personal safety by following the listed points.



Cleaning operation on ship



- First thing first, always wear personal protective equipment (PPE) such as goggles, helmet, gloves, safety shoes etc. while doing chipping and cleaning operations
- Make sure that the work area is clear off of all obstacles and take a look on the safest and nearest escape route
- While doing chipping, scraping, wire brushing etc. always ensure you are wearing goggles and mask. The most common injury in such operation is the eye injury

- Wear safety mask to avoid inhaling of rusty dust and metal flakes
- Wear ear protection when chipping out deck or heavy metals
- Always know the shut down switch or system when working on electric or pneumatic machines such as chippers and scrappers
- Hold the chipping machines correctly to avoid injury to hands
- Ensure your hands are not oily or greasy before using any cleaning tools such as chipper, scrapper, or brush
- If you are cleaning overhead area, ensure that the area is clear and there is no risk of falling objects
- If cleaning near machinery, ensure that you are well away from the operating range of the machines
- If cleaning some machinery, ensure that the machine is switched off and tagged
- If using chemicals for cleaning purpose take all precaution as stated in the “Handling Chemical” section below

- When working on blaster for cleaning deck surfaces, know all the operation and shut down the system of the machine
- Hydro blaster operates with high hydraulic pressure (1000 bars). Do not put your hand over the nozzle when the machine is ON
- Keep clear of high pressure blaster when it is in operation
- Never leave the machinery power ON when unattended
- Avoid cleaning any running machinery
- When cleaning in confined space, take all the safety measures stated in the above chapter



- Wear protective gloves and goggles when handling cleaning compounds, thinners, paints, removers, and other irritants
- Use mask to avoid inhaling of paint vapours
- Do not extend stretch painting operation for long. Take short break and fresh air in between
- Do not climb steep ladders after doing painting operation as vapours may cause dizziness or even unconsciousness
- All paints, paint cleaners, solvents, and brush cleaners are hazardous materials. Read the general precaution stated in MSDS of the paint
- De-energize all equipment in areas being painted, as appropriate
- Do not paint in any area where welding is being performed
- No hot work should be done in the vicinity of area being painted
- Do not smoke when painting. Post "NO SMOKING" signs in the area(s) being painted
- Take precautions to prevent vapour pocketing at low points
- Provide ventilation in closed areas when painting
- Beware of high pressure from spray painting equipment
- Provide explosion proof lighting during spray-painting operations
- Take care and wash hands prior to eating, drinking, smoking etc.



Personal Safety in Bunkering Operation

The oil bunkering onboard ship is one of the most critical operations because of hazards such as fire and oil pollution. A person involved in this operation must know the complete pipeline and tank system to avoid any incident, and should also take care of his or her personal safety.

In this section we will discuss what personal precautions must be taken to avoid any harm to self when undergoing or carrying out bunker operation. Following points to be considered to maintain a safe personal safety parameter to avoid any accidents



- Wear all PPEs such as helmet, oil or rubber gloves, goggles, safety shoes etc.
- When arranging the pipeline or connection, use correct size of tools
- While going down to oil supply barge, always use ship's gangway whenever possible with all safety precautions such as use of safety net etc.

- If using pilot ladder, ensure 3 points contact and do not lean away from the ladder
- Do not carry extra tools with you while using ladder. Use rope and bucket to lower the tools
- Use ship crane or extra assistance to pull or lift heavy bunker pipe on ship
- Do not smoke on deck during bunker operation
- Read complete Material Safety Data Sheet supplied by the bunker provider
- Keep the first aid kit ready to use
- Keep one portable extinguisher ready to use
- Always keep eye wash nearby as the bunker product is hot and irritant to the human eyes
- Wash your skin immediately with plenty of water if it comes in contact with the oil. Remove contaminated shoes and clothing in case they have oil over them.
- Keep the bunker area clear off all tools and equipment to avoid slip, trips and fall

- If oil spill happens, immediately clean the spill by using SOPEP equipment and never run over the spilled oil
- Keep track on the pressure of supplied oil and never lean on the connected oil pipe
- Never lean on the railings of the ship to check or communicate with bunker barge
- If vapours are inhaled, move to fresh air area. If breathing is difficult, take oxygen
- If swallowed, these products may cause nausea, vomiting, diarrhoea and restlessness. DO NOT INDUCE VOMITING. Seek prompt medical attention.

For complete bunkering operation on ship please read-
[Procedure for Bunkering Operation on a Ship](#)

Personal Safety in Handling Chemical

Many tasks undertaken onboard ships involve manual handling of chemicals. Handling toxic chemicals pose a great threat of injuries and adverse health effects to seafarers because of manual handling and/or exposure to chemicals.

Chemicals are mostly used for cleaning and dosing purpose and are found in a number of varieties from simple to concentrated form. It is essential that you familiarize yourself with the manual's content and be prepared to act calm and confident in the event of a hazardous chemical exposure.



- Read and understand the Material Safety Data Sheet for the chemical to be used
- Know the fire fighting requirements for particular chemical through MSDS
- Wear chemical suit, goggles, rubber gloves, and other recommended safety protection gears while using chemicals

- While transporting chemicals make sure the lid of the container is tightly secured
- Do not smoke while handling chemicals
- Ensure no hot work is carried out in the space where chemical is being used
- Ensure the space where chemical is being used is properly ventilated
- Use respirators (air mask) while using chemicals
- If chemical comes in contact with skin, thoroughly wash exposed parts of the body after work, before eating, drinking ,or smoking
- Provide a protective dressing to any part of the body where there are cuts or sores before using chemicals
- Do not carry contaminated items such as dirty rags or tools in the pockets of personal clothing
- Ensure medical first aid, especially eye wash, is readily available at all time

- Ensure portable fire fighting equipment as stated in the MSDS of particular chemical is readily available
- If there is a chemical spill, stop the operation and give priority to cleaning the spill first as some chemicals are flammable and toxic



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Chapter 5

Special Personal Protective Equipment on Ship

- Emergency Escape Breathing Device
- Life Vest
- Self Contained Breathing Apparatus
- Thermal Protective Aid
- Immersion Suit
- Fire Fighters Suit

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This chapter deals with all important personal protection devices which are necessary for the safety of ship's personnel. Mostly used during emergency situations, personal protective equipment (PPE) forms an integral part of safety and crises response procedures on board ships.

Emergency Escape Breathing Device- EEBD

An Emergency Escape Breathing Device (EEBD) is an important life saving appliance, which is used for escaping an area with hazardous conditions such as fire, smoke, poisonous gases etc. All cargo and passenger vessels must carry EEBD, which should be positioned at different locations and comply with amendments of chapter -3 of fire system safety code (FSSC).

It is extremely important for a seafarer to understand the donning and operating procedure of an EEBD in order to use it properly during emergency situation.

Procedure for donning and using EEBD:

- Read the instruction on the EEBD bottle
- Wear the hood or face mask provided with the EEBD
- Make sure you tighten the hood opening from bottom to avoid smoke or gases entering the face mask
- Ensure the face mask is clear and the visibility from the mask is good



- Hang the portable cylinder onto your neck or as described in the instruction
- Open the fresh air valve and check the pressure
- Ensure the mask is properly fitted on the face and no smoke or gases are coming inside
- Do not attempt any rescue after donning EEBD
- Your first priority after donning EEBD should be to come out of the affected space in minimum time
- Never use EEBD for fire fighting

Remember that EEBD provides you fresh air supply for 8-15 minutes, which is sufficient only for escaping from the hazardous or fire affected place, nothing else.



Self Contained Breathing Apparatus (SCBA) is a compressed fresh air supplying device which is used for carrying out operations such as enclosed space entry, fire fighting etc.

This device is mainly use in places where the air does not have enough oxygen to support natural breathing. Every seafarer must know how to operate the self contained breathing apparatus.

Procedure for donning and using SCBA:

- Check the pressure of the bottle to ensure it is full
- Check the condition of the mask, its strap, and the back strap of the bottle for any damage
- Ensure that the warning whistle is working fine to give alarm when the level is below critical limit
- While donning the mask, strap it tightly in such a way that it sits perfectly on the head, preventing any kind of air leakage.
- Don the cylinder with the back strap and tighten the belt



- Always make sure that the cylinder is full and pressurised before entering any confined or smoke filled space
- While climbing or coming down a ladder, never lean towards your back as the added weight of the SCBA can topple you over
- Ensure you have extra spares kept ready for use when entering any space with SCBA
- When the alarm sounds, come out of the space immediately to replace the cylinder

Life Jacket

An important life saving appliance which is used in almost all kinds of emergencies is the life jacket or the life vest. The details for construction and operating requirements of life jacket are given in SOLAS chapter II under LSA code, which was amended in July 2010.

One of the first things a seafarer should check on joining a ship is the place where his or her life jacket is kept in the cabin. Whenever there is an emergency alarm (let it be a drill) take your lifejacket along with you to the muster station.

Life jackets must be worn while working on lifeboats, gangways, over side of ships, pilot stations etc.

Procedure for donning and using life jacket:

- Always check your life jacket for any damage material or torn fabric before using it
- Check all the accessories such as light and whistle attached to the jacket for correct working condition
- Read the instructions posted at different parts of your ship for wearing life jackets. This is because different types of life jackets might have slightly different way of donning.



- Make sure the buckle and straps are in good condition
- After donning the jacket, ensure that it is closed and tightly tied to your body, or else while jumping into the water the jacket might bounce and hit your chin
- Life jackets must be properly stowed.

Thermal protective aid is a type of device used for avoiding excessive loss of body heat which can lead to hypothermia. The thermal protective suit is normally used by those persons who have suffered body heat loss or by those who have been rescued from cold weather conditions.

The suit has a waterproof polymer coated fabric at the inside. The polymer has very low thermal conductivity which helps in reducing heat loss in cold or wet conditions.

Procedure for donning the suit:

- Ensure the TPA is dry from inside
- Check the TPA suit is not damaged or torn
- Insert legs first and cover the whole body till the head
- Tighten the upper portion of the suit such that only the face is out of the TPA
- Be sure to keep your head out in order to breath. Plastic covering mouth and nose can lead to suffocation.



An immersion suit is a body covering suit which is worn specifically for the purpose of remaining afloat and dry during emergencies at high seas. The immersion suit is also known as survival suit or rescue suit. In today's times, an immersion suit is one of the most important necessities on ships and oil rigs, where a person might need something to protect him or her from the hazards of water.

This suit also acts as TPA (but is less effective than TPA) as it avoids the contact of body with the water. In immersion suit, there are sleeves attached for the arms to carry out actions, whereas there are no arms in TPA.

Procedure for donning and checking the Immersion suit:

- Open storage bag and remove the suit
- Step in the suit with legs first. Shoes are not required to be removed
- Don't take off any clothing, as additional clothing will help the insulation of the body
- Close foot and knee tapes tightly around the legs





- Pull the suit up, and place the left arm into the sleeves of the suit using the free hand. Pull the hood of the suit over your head and slip the right arm into the other sleeve
- Pull the zipper slowly upwards and make sure not to get any cloth between the two sides of the zipper
- If the suit is equipped with an additional arm-zipper, close the zipper before entering the water
- Check the water tightness and proper functioning of the zipper
- Check general conditions of the suit for any damage and torn fabric
- Enter the water with feet first and hold both your arms up, covering your face area

Fire Fighter's Suit

The Fire-fighter's suit is a personal protective equipment worn by those crew members who lead the fire fighting operation on ships.

The suit is made of high temperature resistant materials to protect the fire fighters from radiant heat and high temperature.

Procedure for donning and checking Fire fighter's suit:

- SCBA is required along with the suit for fighting fire in smoky and confined spaces of the ship. Check the SCBA condition as described above
- Fire fighter's suit can be in one or two piece. Remove the safety shoes to wear this suit
- Wear safety hood, gloves, and boots (made up of rubber or similar non conductive material with upper layer of thermal retarded material)
- Ensure you keep your trousers over the boots to avoid ingress of water or debris
- Wear SCBA and hard hat
- If life line is provided, wear it around your waist
- Carry fire axe in the slot provided in the suit
- Carry a flame safety lamp
- Do not wear over or under size suit to avoid trip or fall inside the fire affected compartment



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Chapter 6

Miscellaneous Safety Tips & Resources

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Safety at sea is a vital aspect of any shipping operation because of the involvement of human lives and massive financial investments. Though the earlier chapters covered almost everything on personal safety on ships, we want to make sure that nothing is left unsaid as far as safety of ship's crew is concerned.

We have compiled a list of important safety tips, articles, and resources which would help seafarers to take the level of their personal safety on ships to all new level.

Safety Tips



- 1) Personal hygiene and cleanliness is of utmost important. As almost all jobs on ships involve use of chemicals, oils, and grease, make sure you clean yourself properly after coming in contact with them.
- 2) There are several signs boards and symbols posted at different parts of the ship. Familiarize yourself with all of them and in case of doubt don't hesitate to ask your seniors.
- 3) While welding, gas cutting etc. never look directly into the welding arc. Protect your eyes from all activities on ships that can cause harm.
- 4) Never enter ultra violet chamber (used in fresh water system) with the unit power "ON". This can lead to skin and eye trouble.

- 5) Know basic rope and knot techniques for use of ropes while working aloft or during securing stores and spares on ship.
- 6) Know your ship's cargo and all hazards related to it.
- 7) Always refer to MSDS before handling any chemical on ship.
- 8) There can be toxic substances used in making of ship parts. Know the hazards related to various toxic materials such as glass wool, asbestos, carcinogens etc.
- 9) Maintain good housekeeping.
- 10) Keep the surrounding dry to avoid attack of viruses/bacteria such as Legionella Bacteria
- 11) Avoid listening to loud music on headphones. You might not hear the emergency alarm.
- 12) Maintain good housekeeping.
- 13) Never surpass any safety methods/procedures.
- 14) Never underestimate any problem or fault. Always check and report.
- 15) Obey your seniors on safety issues.
- 16) Do not operate any machinery if you don't know the procedure.
- 17) Do not panic or lose control of yourself under any condition.
- 18) Do not take short cuts while doing a job.
- 19) While going out for shore leave, always take an ID proof along.
- 20) Do not take any expensive gifts, articles, or more than required cash on shore leave.
- 21) While going out at a jetty or port, beware of working gantry and cranes and loads carried by them.
- 22) Make sure you carry out oil bunkering or transfer procedure with utmost care.

- 23) If you don't know how to use any personal protective equipment, learn it as soon as possible.
- 24) Maintain effective communication with other crew members.
- 25) Read and understand important maritime conventions, amendments, and laws.
- 26) Know how to operate CO2 fire extinguishing system and fire extinguishers.
- 27) Never drink sea water.
- 28) Call any senior officer when in emergency situation.
- 29) Make sure lashing of cargo is done properly.
- 30) Check for Stowaway while leaving a port.
- 31) Learn how to tackle a man over board situation.
- 32) Never miss a periodic safety routine.
- 33) Know the fire control plan of your ship.
- 34) Know how all fire protection systems work.
- 35) Understand your muster list to perform your duties efficiently.
- 36) Know how to launch a life raft or life boat.
- 37) Learn about safety features of all machinery systems on ships.
- 38) Know how to start emergency generator.
- 39) Find out what all things are provided in SOPEP locker.
- 40) Learn how to use an oil spill kit if provided on board.

- 41) Beware of electrical shocks.
- 42) Know what to do in rough weather.
- 43) Never neglect any alarm.
- 44) Use the right tool for carrying out any maintenance work.
- 45) Never work in dim light.
- 46) Always wear your helmet while working in engine room or on deck.
- 47) Never work without wearing safety shoes.
- 48) Wear gloves while handling hot substances.
- 49) Don't roll up your boiler suit's sleeves while working with hot water, oil, or steam.
- 50) Keep yourself hydrated by drinking water at short interval of time.
- 51) Stay away from drugs and avoid working under the influence of alcohol.
- 52) Exercise regularly to stay physically and mentally fit.
- 53) Stay away from professional politics.
- 54) Never make professional errors that can risk your life and career.
- 55) Always believe in team spirit.

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Important Articles on Safety on Ships

[Basics of fire prevention on board ships](#)

[Ensuring personal safety during mooring operation](#)

[Avoiding Carcinogens on Ships](#)

[What makes Ro-Ro Ships unsafe?](#)

[Harmful effects of drinking sea water](#)

[Why STCW course is important for seafarers?](#)

[Different types of maritime crimes that can land seafarers in trouble](#)

[Hypothermia and its effects on seafarers](#)

[Measures taken to ensure safety of ship's crew, cargo, and marine environment](#)

[Classification of Dangerous Goods](#)

[Different types of non-pyrotechnic marine distress signals](#)

[16 fire fighting appliances and preventive measures used on ships](#)

[12 types of maritime accidents every seafarer should know](#)

[How to avoid fire in the accommodation area?](#)

[The ultimate guide to life jackets](#)

[Safe container lashing for personal safety](#)

[Understanding Neil Robertson Stretcher on ships](#)

[How to rescue a person from a confined space on ships?](#)

[How to lift loads properly and avoid back injury?](#)

[What does IMO say about Stowaway?](#)

[How to ensure personal safety in rough weather?](#)

[What is material safety data sheet \(MSDS\)?](#)

[Understanding International Maritime Dangerous Goods Code \(IMDG\)](#)

[How to tackle man overboard situation on ships?](#)

[What is Basic Safety Induction and Emergency Training \(BOSIET\)?](#)

[What is inflatable survival rescue stick?](#)

[Different periodic safety routines on ships](#)

[Important requirements for fireman's outfit](#)

[A brief overview of ship's fire control plan](#)

[Understanding fire safety system \(FSS\) code on ships](#)

[A brief introduction to survival radios](#)

[SOLAS requirements for Global Maritime Distress Safety System \(GMDSS\)](#)

[Different types of alarms used on ships](#)

[Different types of Immersion suits](#)

[Understanding different parts of SCABA](#)

[Dangers of Asbestos on ships](#)

[Understanding sprinkler system on ship](#)

[Understanding fire fighting CO2 system for cargo holds](#)

[Important features of muster list on ships](#)

[10 main personal protective equipment \(PPEs\) used on ships](#)

[Understanding life rafts on ships](#)

[Safety features on engine room crane one should be aware of](#)

[Types of lifeboat release mechanisms](#)

[Types of lifeboats used on ships](#)

[Understanding oil spill kit on ships](#)

[Procedure for entering enclosed space on ships](#)

[Search and rescue transponder \(SART\) – A general overview](#)

[Emergency position indicating radio beacon \(EPIRB\)](#)

[10 professional mistakes seafarers should never make](#)

[How to break monotony on board ships?](#)

[15 ways to keep mind and body fit on board ships](#)

[Everything you ever wanted to know about sea sickness](#)

[How to avoid politics on ships?](#)

[How to fight stress on ships?](#)

Further Reading

[How Information exchange can help enhance safety at sea?](#)

[Relationship between human error and accidents in shipping industry](#)

[Understanding formal safety assessment in shipping](#)

[What ensures occupational safety and health in shipyards?](#)

[8 main hazards faced by shipyard workers](#)

[Essential requirements for unattended machinery space on ships](#)

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