ELEMENTARY FIRST AID COURSE *HANDOUT*

(IMO Model Course 1.13/STCW A-VI/1)

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ELEMENTARY FIRST AID

COURSE OUTLINE

Duration 2.5 days

Subject Area	Lecture	Demo & Practice
Registration	0.5	
1. General Principles	1.0	Lecture / Presentation
2. Body Structure and Functions	1.0	1.0 (Lecture / Presentation/ Demo)
3. Positioning of Casualty	1.0	0.5(Lecture/Presentation/Workshop/ Exercises)
4.The Unconscious Casualty	0.5	0.5 (Lecture/ Presentation/ Workshop/ Exercises)
5. Resuscitation	0.5	1.5(Lecture/ Demonstration of Equipments)
6. Bleeding	0.5	1.0 (Lecture/ Presentation/ Workshop/ Exercises)
7. Management of Shock	0.5	0.5(Lecture/ Presentation/ Workshop/ Exercises)
8. Burns and Scalds, and Accidents caused by Electricity	0.5	0.5 (Lecture/ Presentation/ Workshop/ Exercises)
9. Rescue and Transport of Casualty	0.5	1.0 (Lecture/Presentation/Exercises/Contingency plans for various security related emergencies)
10. Other Topics	1.0	1.0 (Lecture / Presentation)
Review and Final Assessment	0.5	
Gross Total	**15 Hrs.**	**(2.5 Days)**

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1. Aim

The course aims to provide the training for candidates to provide elementary first aid on board ship, in accordance with Section A-VI/1 of the STCW Code.

2. Objectives

This syllabus covers the requirements of the STCW Convention Chapter VI, Section A-VI/1, table AVI/1-3. On meeting the minimum standard of competence in elementary first aid, a trainee will be competent to take immediate action upon encountering an accident or medical emergency until the of a person with medical first aid skills or the person in charge of medical care on board.

3. Entry Standards

The course is open to all seafarers who are to serve on board sea-going merchant ships. There are no particular educational requirements.

4. Required Attendance

100% attendance is required for successful completion of the course.

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General Principles

Emergency first aid is immediate first aid with the aim of saving the patient's life. The victim's breathing and blood circulation are secured with emergency first aid. Emergency first aid must be given without delay, because the first few minutes are crucial for the patient's survival. Thus, emergency first aid must be started immediately at the scene. The first aid procedures are the same in the case of an accident and an attack of illness.

Emergency first aid procedures consist of the following: assessment of the situation and rescuing the victim from danger, securing breathing, securing circulation, stopping bleeding and treatment of shock. When the situation has been stabilized, the actual treatment and the possible transportation of the patient to shore for further treatment can be started. On arrival at the scene, a rapid evaluation of what has happened must be made. If the dangerous situation continues, the patient must be rescued from it. The helper must at all times make sure that he/she is not in danger him/herself (electric shock, gas, fire, etc.).

First aid administration must be started immediately when it is safe to do so. The patient's own breathing is assessed and mouth-to-mouth respiration started, if necessary. If the patient's heart is not beating, cardiac massage is started. A breathing patient is placed on his / her back and an unconscious patient on his/her side. It must be ensured that the lungs are getting oxygen, the respiratory tract is open and the pulse can be felt. External bleeding must be stopped. When the patient is no longer in imminent danger, he/she is examined more carefully, his/her wounds are bound more carefully, and fractures are supported. The patient is protected and settled as comfortable as possible. Any necessary further medical treatment is initiated, and the patient's condition is monitored constantly, and, if necessary, his/her transportation to shore is arranged.

1. Assessment of the situation	What has happened Safety hazards at the scene (electrocution, fire, gases)
2. Protect yourself from danger and save the patient	Use protective clothing or other safety equipment Eliminate safety hazards (e.g., switch off electric current, air the room)
3. Assess the condition of the patient	
3.1. Patient is breathing	Make sure that respiratory tract stays open

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3.2. Patient is not breathing	Open respiratory tract • remove any foreign objects • tilt head backwards Start cardiac massage • press 30 times Start mouth-to-mouth respiration • blow twice, check that the patient's chest rises • if the chest does not rise, check the position of the head Check the pulse or signs of circulation; if there are none, continue resuscitation • rhythm of resuscitation: press 30 times, blow twice
4. Patient is bleeding	Stop bleeding • raise the limb • press the wound with hands using dressings • if necessary, bind the wound with a pressure bandage
5. Patient is in shock	Determine the cause of shock • bleeding • allergy
5.1. Shock caused by bleeding	Place the patient on his/her back, elevate lower limbs Start intravenous infusion
5.2. Allergic shock	Administer adrenaline (1 mg/ml) 0.5–1.0 ml

First Things First

All too often we get caught up in some minor detail and miss the big picture, or to put it another way, "we miss the forest for the trees". It is important to keep in mind the following priorities when performing first aid.

Always perform first aid in the following order:

1. **Restore Breathing:** A person becomes brain dead in 6 minutes if breathing is not restored.

2. **Stop Severe Bleeding:** Without blood, oxygen cannot get to the vital organs of a person's body.

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3. **Treat Shock:** A victims mind and body must work together in order to be healthy. Never overlook shock situations, be they mental or physical.

4. **Call advanced medical help immediately**: Always realize that you are providing a stop-gap function to an injured person. Always obtain trained medical assistance as soon as possible. It also is good first aid practice to have even minor wounds checked when expert medical assistance is available.

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Body Structure and Functions

In order for the member to learn to perform first aid procedures, he must have a basic understanding of what the vital body functions are and what the result will be if they are damaged or not functioning.

a. Breathing Process. All humans must have oxygen to live. Through the breathing process, the lungs draw oxygen from the air and put it into the blood. The heart pumps the blood through the body to be used by the cells that require a constant supply of oxygen. Some cells are more dependent on a constant supply of oxygen than others. For example, cells of the brain may die within 4 to 6 minutes without oxygen. Once these cells die, they are lost forever since they do not regenerate. This could result in permanent brain damage, paralysis, or death.

b. Respiration. Respiration occurs when a person inhales (oxygen is taken into the body) and then exhales (carbon dioxide [CO2] is expelled from the body). Respiration involves the-

• *Airway*. The airway consists of the nose, mouth, throat, voice box, and windpipe. It is the canal through which air passes to and from the lungs.

• *Lungs*. The lungs are two elastic organs made up of thousands of tiny air spaces and covered by an airtight membrane. The *bronchial tree* is a part of the lungs.

• *Rib cage*. The rib cage is formed by the muscle connected ribs, which join the spine in back, and the breastbone in front.
The top part of the rib cage is closed by the structure of the neck, and the bottom part is separated from the abdominal cavity by a large dome-shaped muscle called the *diaphragm* (Figure 1-1). The diaphragm and rib muscles ,which are under the control of the respiratory center in the brain, automatically *contract* and *relax*. *Contraction* increases and *relaxation*
decreases the size of the rib cage. When the rib cage increases and then decreases, the air pressure in the lungs is first less and then more than the atmospheric pressure, thus causing the air to rush into and out of the lungs to equalize the pressure. This cycle of inhaling and exhaling is repeated about12 to 18 times per minute.

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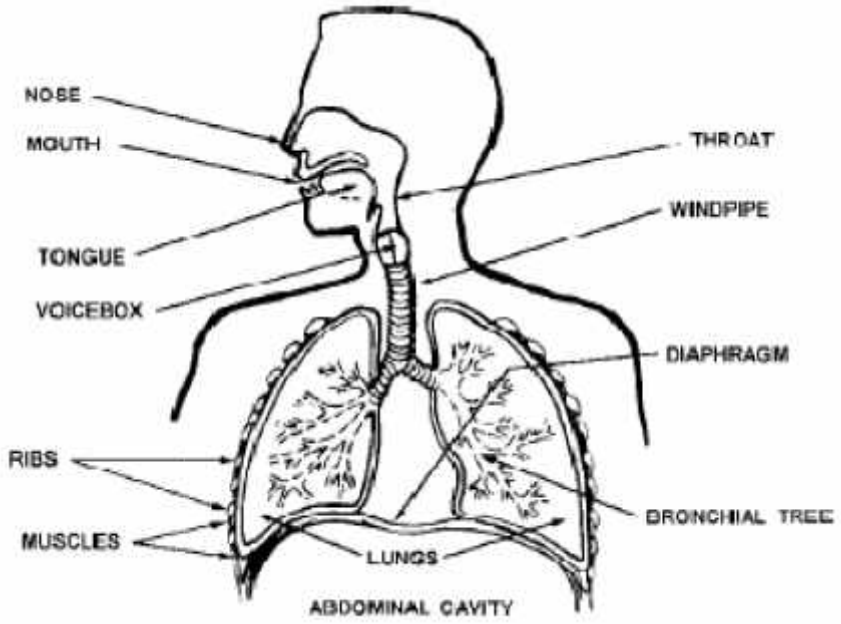

c. Blood Circulation. The heart and the blood vessels (arteries, veins, and capillaries) circulate blood through the body tissues. The heart is divided into two separate halves, each acting as a pump. The left side pumps oxygenated blood (bright red) through the arteries into the capillaries;
nutrients and oxygen pass from the blood through the walls of the capillaries into the cells. At the same time waste products and CO2 enter the capillaries. From the capillaries the oxygen poor blood is carried through the veins to the right side of the heart and then into the lungs where it expels the CO2 and picks up oxygen. Blood in the veins is dark red because of its low oxygen
content. Blood does not flow through the veins in spurts as it does through the arteries. The entire system of the heart, blood vessels, and lymphatic is called the *circulatory system.*

(1) *Heartbeat.* The heart functions as a pump to circulate the blood continuously through the blood vessels to all parts of the body. It contracts, forcing the blood from its chambers; then it relaxes, permitting its chambers to refill with blood. The rhythmical cycle of contraction and
relaxation is called the *heartbeat*. The normal heartbeat is from 60 to 80beats per minute.

(2) *Pulse.* The heartbeat causes a rhythmical expansion and contraction of the arteries as it forces blood through them. This cycle of expansion and contraction can be felt (monitored) at various points in the body and is called the *pulse.* The common points for checking the pulse are at the -

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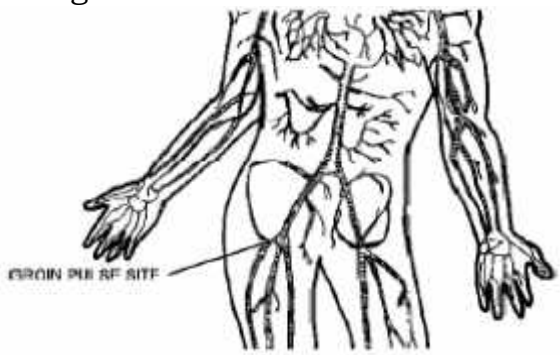
• Side of the neck (*carotid*).
• Groin (*femoral*).
• Wrist (*radial*).
• Ankle (*posterior tibial*).

(*a*) *Carotid pulse.* To check the carotid pulse, feel for a pulse on the side of the casualty's neck closest to you. This is done by placing the tips of your first two fingers beside his Adam's apple (Figure 1-2).

(*b*) *Femoral pulse.* To check the femoral pulse, press the tips of your first two fingers into the middle of the groin.



(*c*) *Radial pulse.* To check the radial pulse, place your first two fingers on the thumb side of the casualty's wrist.

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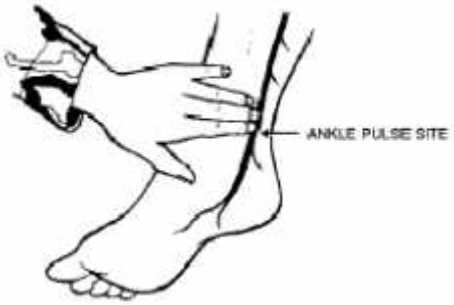
(*d*) *Posterior tibial pulse*. To check the posterior tibial pulse, place your first two fingers on the inside of the ankle.



DO NOT *use your thumb to check a casualty's pulse because you may confuse the beat of your pulse with that of the casualty.*

Vital organs

Humans have five vital organs that are essential for survival. These are the brain, heart, kidneys, liver and lungs.

The human brain is the body's control center, receiving and sending signals to other organs through the nervous system and through secreted hormones. It is responsible for our thoughts, feelings, memory storage and general perception of the world.

The human heart is a responsible for pumping blood throughout our body.

The job of the kidneys is to remove waste and extra fluid from the blood. The kidneys take urea out of the blood and combine it with water and other substances to make urine.

The liver has many functions, including detoxifying of harmful chemicals, breakdown of drugs, filtering of blood, secretion of bile and production of blood-clotting proteins.

The lungs are responsible for removing oxygen from the air we breathe and transferring it to our blood where it can be sent to our cells. The lungs also remove

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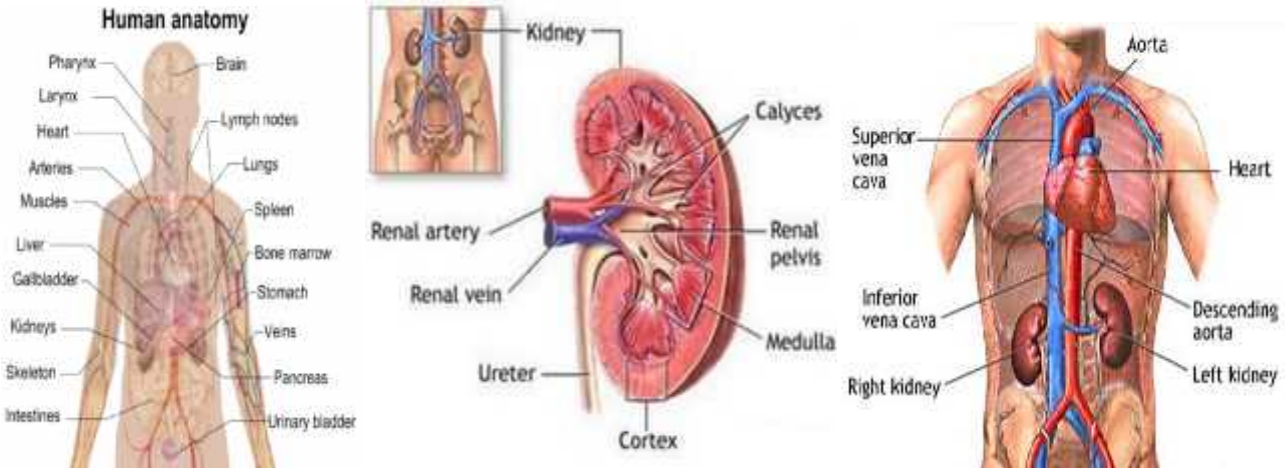
carbon dioxide, which we exhale.



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Positioning of Casualty

Casualty Positioning

Once you've treated the injury or illness you are not quite out of the woods until further help arrives. In that time, correct positioning of the casualty can aid recovery in the same way that poor positioning can very easily aggravate the injury or exacerbate the condition. Here are a few positions to consider.

Safe Airway Position

Without airway management equipment or techniques unconscious casualties will die on their back. We can open their airway with a simple head tilt but this does not prevent fluids (blood or saliva) draining down or coming up (vomit or blood) and entering the airway.

Any unconscious casualty (even with a suspected spinal injury) should be positioned onto their side because, quite simply, if you don't have an airway, you don't have a casualty.

Regardless of whether you call it the *Safe Airway Position, Recovery Position, Drainage Position, Left lateral Recumbent* or *Three-Quarter Prone*, we're going to flip them over.

How to do it

- Remove the victim’s glasses, if present.
- Kneel beside the victim and make sure that both his legs are straight.
- Place the arm nearest to you out to you side – **DO NOT** place the shoulder and elbow at right angles. This is unnecessarily painful for people with limited range of movement and places pressure on the lower arm.

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- Bring the far arm across the chest, and hold the back of the hand against the victim's cheek nearest to you.
- With your other hand, grasp the far leg just above the knee and pull it up, keeping the foot on the ground.
- Keeping their hand pressed against their cheek, pull on the far leg to roll the victim towards you on to their side.
- Adjust the upper leg so that both the hip and knee are bent at right angles.
- Tilt the head back to make sure that the airway remains open.
- If necessary, adjust the hand under the cheek to keep the head tilted and facing downwards to allow liquid material to drain from the mouth.
- Check breathing regularly.
- If the victim has to be kept in the recovery position for more than 30 min turn him to the opposite side to relieve the pressure on the lower arm.

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Left of Right?

The Safe Airway Position is often called Left lateral Recumbent, especially in the US. There is sometimes milage in positioning the casualty on their left; the most cited reason - and most plausible - is significant for women in the later stages of

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pregnancy when positioning the casualty on their right will apply pressure from the foetus onto the superior vena cava (one of the two large vessels which return deoxygenated blood to the heart) impeding circulation. Other reasons include:

- Stomach curves to the left, so vomit would have an extra curve to overcome
- Stomach curves to left, so contents won't be pushing against sphincter.
- In the ambulance, attendant can watch him better facing toward him.
- Improved ventilation given the right lung being slightly larger than the left and left main stem bronchus being at an angle.

There is no real evidence for any of these justifications so it would seem that many of the reasons given are - as is often the way in First Aid - largely historical cliche's perpetuated because it is really easy to teach people what you have been taught rather than actually looking into what you are teaching.

In fact, positioning on the left can have adverse effects for some conditions, such as Congestive Heart Failure (1) or increase absorption of ingested poisons (2).

Let's be pragmatic.

Depending on the position your casualty is already found in and obstacles around them you may not have the luxury of this choice. Practice positioning your casualties on either left or right and position them appropriately to

1. Maximize drainage without
2. Aggravating injuries or illnesses.
3. Roll casualties with chest injuries onto the injured side to protect the unaffected lung.

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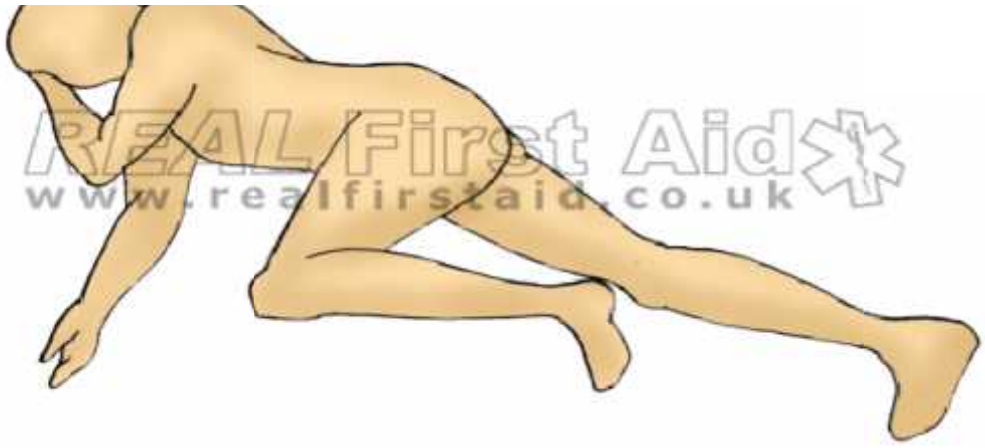
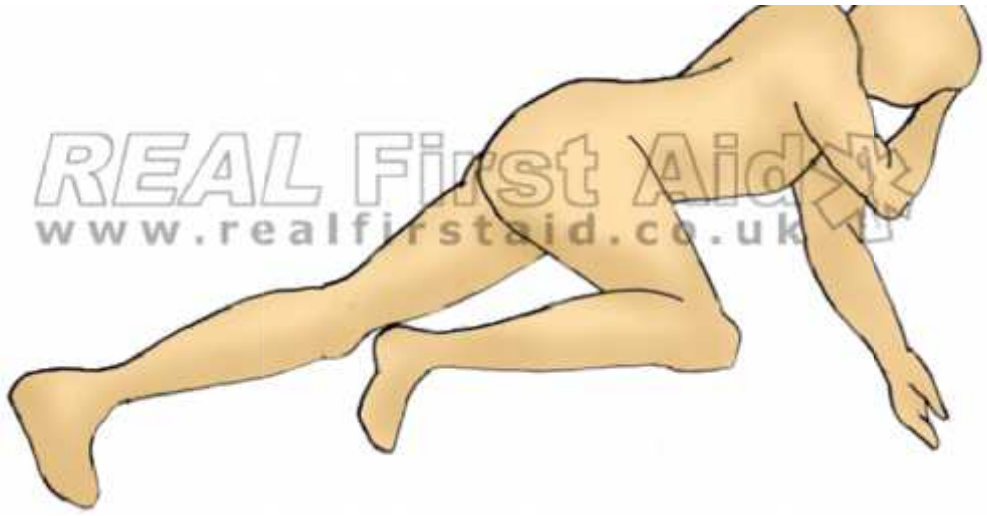


Safe Airway Position Right



Safe Airway Position Left

Lying Down

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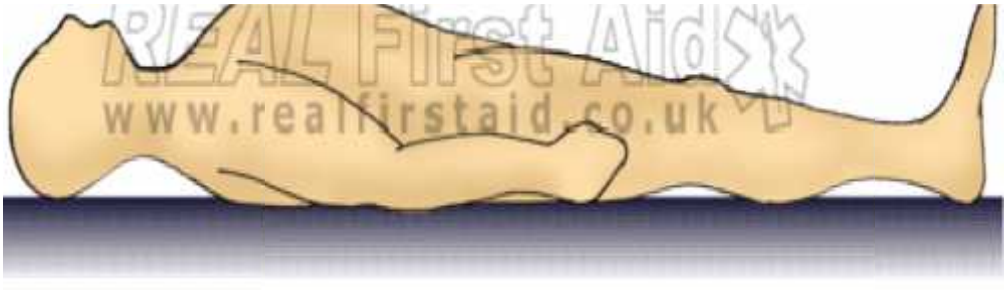
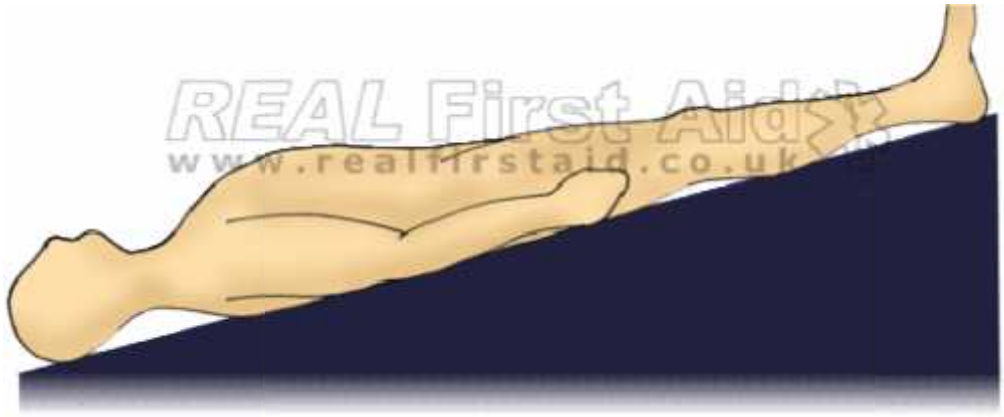
Recumbent



Supine

Supine - Knees Bent



Trendelenburg

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Inclined

If the causality is alert or we are able to manage their airway with suction and airway adjuncts, it is sometimes beneficial for the casualty to remain on their back. **Recumbent** is a posh word for simply lying down with their head supported by a pillow and is the most common and appropriate position for someone who simply needs rest. A slight modification for this would be to remove the pillow which would be appropriate for someone with a suspected spinal injury. This position is now called **Supine.** Neither of these positions are recommended for head injury (where the priority is to reduce intracranial pressure) or for casualties with breathing problems or chest pain. In reality most conscious casualties with these conditions won't let you lay them flat

While we're on the subject of letting the casualty assume the most comfortable position, most people with abdominal pain will draw their knees in. If that's what they want, let them do it. Supporting under the knees is also meant to relieve pain from pelvic injuries - this is subjective so offer it, don't force it.

Sometimes a tilt can help; most ambulance trolleys will have this option but in the outdoors we have hills and slopes we can utilize. With the legs elevated the **Trendelenburg** position can improve venous drainage from lower limbs and improve blood supply to the head but with pressure on the diaphragm from below, respiration can be reduced. **Inclining** the whole body downhill can reduce intracranial pressure and without pressure on the diaphragm, easy respiration.

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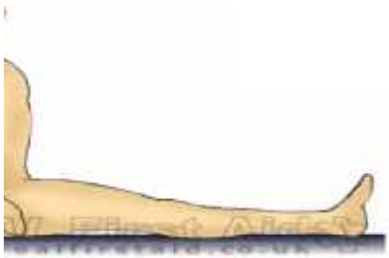
Sat Up

We often have a tendency to force our casualty to lie down. It's traditional. Like a default position for poorly people. Sometimes, allowing or encouraging your casualty to sit up will make their day.

Semi-recumbent

An **upright** or **semi-recumbent** position is not just comfortable for some casualties it can greatly assist their recovery. Upright positions will reduce intracranial pressure, essential for head injuries, and assist breathing.



Upright

The **W Position** is one of the most common positions the conscious casualty will adopt and a safe bet for anyone with a reduced level of consciousness;

if they're on the floor they can't fall off it. It's good for head injuries, chest pain, breathing problems and abdominal pain

W Position

The Shock Position

For years we have been told that the casualty who is in shock needs to lie down with their legs elevated because this will drain blood from the legs into the core to:

- Improve cardiac output
- Improve systemic vascular resistance
- Improved mean arterial pressure
- Improved systolic blood pressure

There is **no evidence of any standard** that this is of real benefit. If you think about it, you know there is no available blood in the legs because the casualty is cold and pale - they are already shunting any available blood to the core by vasoconstriction.

And if they are going into shock we can expect their level of consciousness to drop. How do unconscious casualties die? Oh, that's right, on their backs.

Anaphylaxis

Several awarding bodies still teach this for the treatment of hypovolemic shock as well as the treatment of anaphylactic shock. This position may be helpful for the anaphylactic casualty with low blood pressure but given 80% of cases present with skin rashes and 70% with difficulty breathing compared to the 10-45% who present with low blood pressure (5) elevating the legs could be the absolute worst thing you can do for them. For the conscious casualty, they will adopt a comfortable position, probably the **W Position** or **Semi Recumbent** (6, 7). Anyone unconscious is placed into the **Safe Airway Position** if airway management equipment and techniques are not available.

Conclusions

Don't just leave them as you found them for fear of causing injury and neither flip them into a textbook position just because you were told to once.

Prioritise the airway - even with a spinal injury - a casualty without a clear and open airway will not last long.

If the casualty is conscious allow them to adopt the most comfortable position for them; they will know what relives pain or eases breathing much better than you and they will not appreciate being forced into an uncomfortable position just because it '*looks right*'.

Be pragmatic: Do the best you can based on the position they are found in and obstacles around them with as little movement as possible to avoid aggravating injuries. More often than not the Real World is not Text Book.

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The Unconscious Casualty

Someone who is unconscious

If you see someone who has collapsed, you need to confirm whether they are **unconscious and breathing** or **unconscious and not breathing**.

The safest thing to do is get professional help as quickly as possible. If other people are around, get someone help. If you are alone, shout for help and as soon as someone arrives get them to inform bridge as soon as possible.

Unconscious and breathing

DRAB survey

While you are waiting for help to arrive, follow the primary **DRAB** survey steps - **D**anger, **R**esponse, **A**irway, **and Breathing**.

Danger

Check that neither you nor the unconscious person is in any danger. If necessary make the area safe and then assess them.

Response - unconscious adult or child

If you are still alone, shout for help again and then see if the person responds:

- Shout at them - for example: 'Can you hear me?' or 'Open your eyes'.
- Gently shake their shoulders.

Response - unconscious infant

If it is an unconscious infant (under 12 months), to check for a response:

- Tap or flick the sole of an infant's foot to try to elicit a response.
- Do not shake an infant.

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Airway

If they respond, they are breathing but check for severe bleeding and other injuries. You may need to help them to breathe by opening their airway:

- Place one hand on the forehead and, using two fingers, lift the chin

Breathing

If they don't respond, you need to check if they are breathing:

- Position your cheek close to their mouth.
- Look, listen and feel for no more than 10 seconds:
  - Look to see if the chest is rising and falling.
  - Listen for breathing.
  - Feel the breath against your cheek.

Recovery position

If they are breathing put those in the recovery position until help arrives:

- Turn them on to their side.
- Lift chin forward in open airway position and adjust hand under the cheek as necessary.
- Check they cannot roll forwards or backwards.
- Monitor breathing continuously.
- If injuries allow, turn them to the other side after 30 minutes.

Unconscious and not breathing

Having completed the DRAB survey steps above and established the person is not breathing; give cardiopulmonary resuscitation (CPR). This is a technique whereby oxygen is pumped around the body, using a combination of **chest compressions** and **rescue breaths**.

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Unconscious and not breathing adult

- Chest compressions:
  - Place the heel of your hand (the base of your thumb) in the centre of the chest.
  - Place your other hand on top and interlock fingers.
  - Keeping your arms straight and your fingers off the chest press down by five to six centimeters and release the pressure, keeping your hands in place.
  - Repeat the compressions 30 times, at a rate of 100-120 per minute (about the speed of the song 'Staying Alive' or 'Nelly the Elephant').
- Next give 2 rescue breaths:
  - Ensure the airway is open.
  - Pinch their nose firmly closed.
  - Take a deep breath and seal your lips around their mouth.
  - Blow into the mouth until the chest rises.
  - Remove your mouth and allow the chest to fall.
  - Repeat once more.

If you are unable, unwilling or untrained to give rescue breaths, give chest compressions only and continue at a rate of 100-120 per minute.

Unconscious and not breathing child

If it is an unconscious **child** (1 year to puberty) who is not breathing, start with **rescue breaths**:

- Ensure the airway is open.
- Seal your lips around the child's mouth.
- Blow gently into their lungs, looking along the chest as you breathe.
- As the chest rises, stop blowing and allow it to fall.
- Repeat this 5 times.

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Then give **compressions**:

- Place one or two hands in the centre of the chest (depending on the size of the child). You can do this without removing the child's clothes.
- Use the heel of that hand with arms straight and press down to a third of the depth of the chest.
- Press 30 times, at a rate of 100-120 compressions per minute (about the speed of the song 'Staying Alive' or 'Nelly the Elephant').

After 30 compressions, give 2 more rescue breaths, Repeat the sequence of 30 chest compressions and 2 rescue breaths until help arrives.

Unconscious and not breathing infant

If the infant is not breathing, start with **5 rescue breaths** as for a child, followed by **compressions**:

- Place the baby on a firm surface.
- Locate a position in the centre of the chest - it is possible to identify the correct hand position without removing the infant's clothes.
- Using two fingers, press down sharply to a third of the depth of the chest.
- Press 30 times, at a rate of 100-120 compressions per minute.

After 30 compressions, give 2 more rescue breaths and if help still hasn't arrived, repeat the sequence of 30 chest compressions and 2 rescue breaths until help arrives.

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Resuscitation

Cardiopulmonary resuscitation, commonly known as **CPR**, is an emergency procedure that combines chest compression often with artificial ventilation in an effort to manually preserve intact brain function until further measures are taken to restore spontaneous blood circulation and breathing in a person who is in cardiac arrest. It is indicated in those who are unresponsive with no breathing or abnormal breathing, for example, agonal respirations.

CPR involves chest compressions for adults between 5 cm (2.0 in) and 6 cm (2.4 in) deep and at a rate of at least 100 to 120 per minute. The rescuer may also provide artificial ventilation by either exhaling air into the subject's mouth or nose (mouth-to-mouth resuscitation) or using a device that pushes air into the subject's lungs (mechanical ventilation). Current recommendations place emphasis on high-quality chest compressions over artificial ventilation; a simplified CPR method involving chest compressions only is recommended for untrained rescuers. In children only doing compressions may result in worse outcomes.

CPR alone is unlikely to restart the heart; Its main purpose is to restore partial flow of oxygenated blood to the brain and heart. The objective is to delay tissue and to extend the brief window of opportunity for a successful resuscitation without permanent brain damage. Administration of an electric shock to the subject's heart, termed defibrillation, is usually needed in order to restore a viable or "perfusing" heart rhythm. Defibrillation is effective only for certain heart rhythms, namely ventricular fibrillation or pulse less ventricular tachycardia, rather than asystole or pulse less electrical activity. CPR may succeed in inducing a heart rhythm that may be shock able. In general, CPR is continued until the person has a return of spontaneous circulation (ROSC) or is declared dead.

If an adult is unresponsive and not breathing, you'll need to do CPR (which is short for cardiopulmonary resuscitation). CPR involves giving someone a combination of chest compressions and rescue breaths to keep their heart and circulation going to try to save their life. If they start breathing normally again, stop CPR and put them

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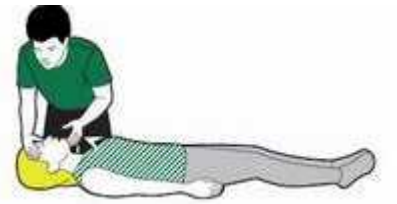
in the recovery position.

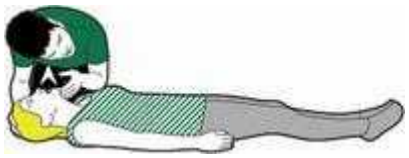
Step 1 of 5: Open their airway



• If they are unresponsive, open their airway.

• Place one hand on the casualty's forehead and two fingers under their chin. Gently tilt their head back and lift the chin.

Step 2 of 5: Check their breathing



- Maintain the head tilt and chin lift, and look for chest movement. Listen for the sounds of normal breathing and see if you can feel their breaths on your cheek.

If they are not breathing, you need to start CPR (cardiopulmonary resuscitation – a combination of chest pressure and rescue breaths) straight away.

Step 3 of 5: Call for help and start CPR

- Call for an ambulance, or get someone else to do it, or inform bridge.

Next you'll need to perform CPR - cardiopulmonary resuscitation. This involves giving someone chest compressions and rescue breaths to keep their heart and

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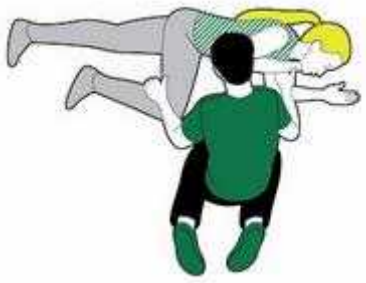
circulation going.

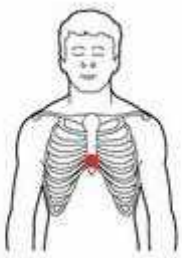
If they start breathing normally again, stop CPR and put them in the recovery position.



Step 4 of 5: Giving chest compressions

• Kneel down beside the casualty on the floor level with their chest.

• Place the heel of one hand towards the end of their breastbone, in the centre of their chest.



• Place the heel of your other hand on top of the first hand and interlock your fingers, making sure you keep the fingers off the ribs.

• Lean over the casualty, with your arms straight, pressing down vertically on the breastbone, and press the chest down by 5-6cm (2-2½in).

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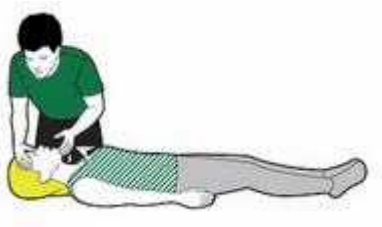
• Release the pressure without removing your hands from their chest. Allow the chest to come back up fully – this is one compression.

Repeat 30 times, at a rate of about twice a second or the speed of the song 'Staying Alive'.

Give two rescue breaths.

Step 5 of 5: How to give a rescue breath



• Ensure the casualty's airway is open.

• Pinch their nose firmly closed.

• Take a deep breath and seal your lips around their mouth.

• Blow into the mouth until the chest rises.

• Remove your mouth and allow the chest to fall.

Repeat once more.

Carry on giving 30 chest compressions followed by two rescue breaths for as long as you can, or until help arrives.

If the casualty starts breathing normally again, stop CPR and put them in the recovery position.

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Bleeding

Bleeding

In this section you can find out what to do about bleeding and blood loss. You can learn how to give first aid treatment for cuts, grazes, and nose bleeds as well as finding out what to do if someone is bleeding severely.

You can usually control bleeding from cuts and grazes by elevating the wound and applying pressure.

A nose bleed can be serious if someone loses a lot of blood – and severe bleeding can cause distress, lead to shock and loss of responsiveness. This advice will help to give you the confidence to know what to do when a person is bleeding severely.

Bleeding topics:

Cuts and grazes

Nose bleeds

Severe bleeding

Cuts and grazes

Cuts and grazes are common injuries that can usually be treated at home. A cut is when the skin is fully broken, and a graze is when only the top layers of skin are scraped off.

Usually, all you need to do is clean the cut or graze to reduce infection and apply pressure and raise the injury to stop the bleeding. The wound should heal by itself in a few days.

What to look for - Cuts and grazes

If the bleeding doesn't stop, or if there's a foreign object in the cut, or you think it might be infected, then you should tell them to see a health care professional.

What to do - Cuts and grazes

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Clean the wound by rinsing it under running water or using alcohol-free wipes.

Pat it dry using a gauze swab and cover it with sterile gauze. If you don't have these, then use a clean, non-fluffy cloth.

Raise and support the part of the body that's injured. If it's a hand or arm, raise it above the head. If it's a lower limb, lay them down and raise the cut area above the level of the heart. This will help stop the bleeding.

Remove the gauze covering the wound and apply a sterile dressing.

If you think there's any risk of infection then suggest they see a health care professional.

Nose bleeds

A nose bleed is when blood flows from one or both nostrils. It's normally caused by the tiny blood vessels inside the nostrils being ruptured.

Common causes of nose bleeds include a blow to the nose, sneezing, picking or blowing the nose, and high blood pressure.

What to look for - Nose bleeds

Most nose bleeds are minor and only last a few minutes, but they can be dangerous if someone loses a lot of blood.

If someone has had a blow to the head, the blood may appear thin and watery. This could mean that their skull is fractured and fluid is leaking from around the brain. If that happens, it is very serious and you should call for emergency medical help.

What to do - Nose bleeds

If someone is having a nose bleed, your priority is to control the bleeding and keep their airway open.

Get them to sit down (not lie down) as keeping the nose above the heart will reduce bleeding.

Get them to lean forward (not backwards), to make sure the blood drains out

through their nose, rather than down their throat which could block their airway.

Severe Bleeding

When bleeding is severe, it can be dramatic and distressing. If someone's bleeding isn't controlled quickly, they may develop shock and lose consciousness. Shock does not mean emotional shock, but is a life-threatening condition, often caused by loss of blood.

If someone's bleeding from their mouth or nose, they may find it hard to breathe, so you should keep a close eye on them in case they become unresponsive.

If there's an object in their wound, don't press directly onto it, as it will hurt, but leave it in there and bandage around it.

With all open wounds, there's a risk of infection, so wash your hands and use gloves (if you have any) to help prevent any infection passing between you both.

What you need to do - severe bleeding

Your priority is to stop the bleeding. Protect yourself by wearing gloves.

If the wound is covered by the casualty's clothing, remove or cut the clothes to uncover the wound.

If there an object in the wound

If there's an object in there, don't pull it out, because it may be acting as a plug to reduce the bleeding. Instead, leave it in and apply pressure either side of it with a pad (such as a clean cloth) or fingers, until a sterile dressing is available.

If there's no object in the wound

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Follow the steps below for treating severe bleeding.

Step 1 of 2: Press it

• Put direct pressure on the wound with your fingers, using a sterile dressing if possible, to stop blood escaping.

Step 2 of 2: Call for medical help

• Firmly wrap a bandage around the pad or dressing on top of the wound to control the bleeding. Make it firm enough to maintain pressure but not so tight that it restricts their circulation.

• Treat them for shock: lay them down with their head low and their legs raised and supported.

Waiting for help

• If blood shows through the pad or dressing, don't remove it: apply a second dressing on top of the first one. If blood then seeps through both dressings, remove both of them and replace them with a fresh dressing. When changing dressings, make sure you keep pressure applied to where the bleeding is coming from.

• If you can, support the injured area. For example, you can rest a leg on some cushions, or for an arm you can make a sling.

• Keep checking the casualty's breathing, pulse and level of response.

• If they become unresponsive at any point, open their airway, check their breathing, and prepare to treat someone who has become unresponsive.

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Management of shock

Shock is a disturbance of the circulation that can originate from various causes. In a state of shock, the blood pressure is too low to maintain sufficient circulation, resulting in severe oxygen deficiency. Of the vital organs, the kidneys require the highest level of blood pressure in order to function properly (systolic blood pressure at least 80 mmHg). The same level of blood pressure is necessary for the pulse to be felt from the radial artery. If the pulse cannot be felt from the radial artery, the patient is in shock, or he/she will probably go into shock.

Causes

Shock has many causes. It can be caused by an insufficient amount of blood, due to, e.g. bleeding. Internal bleeding is usually not visible, and is therefore detected only when the symptoms of shock appear. Simple fractures (no open wound at the site of fracture) may bleed substantially into the tissues. The amount of blood that the patient has lost can be estimated by following the general state of circulation and the appearance of possible symptoms of shock (pulse, blood pressure, skin temperature). Dehydration due to widespread burns, severe diarrhea or vomiting may also cause shock. A strong allergic reaction, anaphylactic shock or sepsis may result in failure of the regulation mechanism of the blood vessels. This causes the blood vessels to expand and the circulating amount of blood can no longer maintain sufficient pressure. Failure of the heart's pumping strength in connection with myocardial infarction may also lead to insufficient blood pressure and shock.

Amount of bleeding in different fracture types

Type of fracture	Amount of bleeding
Simple fracture	
rib	125/rib
humerus	350–800
shin bone	500–1 000
thigh bone	1 000–2 000
pelvis	1 500–2 000
Compound fracture	Amount of bleeding may be double that of a corresponding simple fracture.

Symptoms

The body tries to compensate the fall in blood pressure in many ways to ensure a sufficient blood supply to the vital organs, such as the heart and the brain. First, the heart rate increases. Then, peripheral blood vessels start to contract, peripheral circulation decreases strongly, and the skin, especially in the limbs, turns cold. The sweat glands are activated, making the skin feel cold and clammy.

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Low blood pressure is a sign that the disorder has already progressed quite far. The pulse can no longer be felt from the wrist (systolic blood pressure under 80 mmHg) and the circulation of the internal organs deteriorates. When systolic blood pressure has dropped to 60 mmHg, the brain starts to suffer from oxygen deficiency. The patient becomes restless or even aggressive. If the blood pressure keeps falling, the patient becomes confused, his/her level of consciousness then diminishes further until unconsciousness and death occurs. The relationship between symptoms of bleeding shock and the amount of blood lost is presented in Table.

Allergic (anaphylactic) shock is caused by expansion of blood vessels due to paralysis of the muscles in the vessel walls. In this case, the normal amount of blood cannot sustain sufficient blood pressure, because the volume of the blood vessels has increased. The pulse is rapid, but the hands and feet stay warm, unlike in shock due to other causes.

Symptoms of bleeding shock in relation to amount of blood lost

Amount of blood lost	**Symptoms**
10% (= 500 ml)	no symptoms
15–25% (= 750–1 250 ml)	slightly increased pulse (ca. 100/min)
25–35% (= 1 250–1 750 ml)	increased pulse (100–120/min) pallor, cold clammy skin blood pressure 90–100 mmHg
50% (= 2 500 ml)	pulse over 120/min blood pressure under 60 mmHg disturbances in consciousness

Treatment

Bleeding shock

The treatment of bleeding shock is primarily efficient first aid, securing basic vital functions and treating the causes of shock. Make sure that the airways are open and the patient is breathing. Stop the bleeding. The circulation in the vital organs can be supported by placing the patient on his/her back and raising his/her legs.

- Elevating the lower limbs enhances the circulation of the brain, the heart and other vital organs.

Dehydration is treated with intravenous infusion therapy, that is, intravenous fluid replacement (see Chapter 45 Intravenous(IV) infusion therapy). The oxygen supply

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of the tissues is supported by giving oxygen(e.g. 28%) with a mask. Do not give the patient anything to eat or drink.
The patient's condition and level of consciousness must be continuously monitored, because his/her status may change very rapidly, and the treatment should respond immediately to any changes. It is important to monitor the blood pressure, pulse and temperature of the skin. Keeping the patient warm, and calming and reassuring him/her help to reduce the body's need for oxygen.

- Consult a doctor via Radio Medical for further treatment of bleeding shock.

Allergic shock
A sudden allergic reaction can be caused by an insect sting, food or a drug. Symptoms that may appear within minutes can be dyspnoea, runny nose, bloods hot and itching eyes, rash, or even shock and death.
The first symptoms of an allergic shock may be reddening and itching skin, swelling of the tongue and the pharynx, wheezing breathing, a feeling of pressure in the chest, and difficulties in breathing. The blood pressure can drop and cause weakness, vertigo and fainting. The throat,
the larynx and the respiratory tract may swell up, making breathing and swallowing difficult. Speech is often slow and clumsy. The condition can rapidly become life-threatening.
The first aid in allergic shock is always adrenaline (8/A, 1 mg/ml). The dose given to an adult is 0.5–1.0 ml subcutaneously or intramuscularly. If the symptoms are severe or shock is developing, or has already developed, the adrenaline is injected into the muscles of the tongue, where the
circulation is good despite shock, and the drug is absorbed rapidly. Take hold of the tongue with a piece of cloth or paper, and inject the drug directly into the tongue(Figure 9). The injection can be repeated after 10–20 minutes.
After alleviating the most dangerous situation with adrenaline, hydrocortisone 2ml (5/C, 125 mg/ml) is administered intramuscularly. Treatment is continued with prednisolone (5/D) given daily in the morning. On the first morning the dose of prednisolone (5/D) is eight 5 mg tablets,
all given at one time. The dose is reduced every other morning by 1–2 tablets, until the treatment is completed. The patient should visit a doctor to try to determine the cause of the allergic
reaction, so that, by avoiding the allergen, the reaction can be prevented from recurring.

- Consult a doctor via Radio Medical on further treatment of an allergic reaction.

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Injection into the tongue

In mild disorders (hay fever, itching eyes ,nettle rash) without circulatory or respiratory symptoms, sufficient treatment usually consists of cetirizine hydrochloride (5/B)one 10 mg tablet once or twice a day, orprednisolone (5/D). To begin with, six 5 mg prednisolone tablets are given, all at one time. The dose is reduced every other day by 1–2 tablets, until the treatment is completed. The patient should visit a doctor to try to determine the cause of the allergic reaction, so that, by avoiding the allergen, the reaction can be prevented from recurring.

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Burns and Scalds, and Accidents caused by Electricity

Burns and scalds, a type of burn caused by wet heat, are potentially fatal injuries. They can cause life-threatening shock through serious fluid loss and, if around the face and neck, can restrict breathing.

WHAT ARE THE RISKS FROM BURNS?

In burns, fluid is lost in three main ways:

- Blistering
- Swelling around the injury
- Directly from the injury

While the fluid loss may not be visible as liquid lying around the victim it is nevertheless lost from the blood as a straw-colored substance known as plasma. Severe burns therefore can and often do prove to be fatal.

The second risk from burns is infection. The damaged tissue provides little or no resistance to infection and serious problems may arise some time after the initial injury. The risk of infection increases with the size and depth of the burn, and the victim will probably suffer from shock as well.

CAUSES OF BURNS

Dry eat

This is the most common type of burn and includes burns caused by hot objects such as exhausts or by cigarettes or lighters.

Wet heat

Also known as a scald, wet heat usually refers to hot water or steam but it can also include other hot liquids such as oil or fat.

Friction

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When two objects rub together very quickly friction generates heat, causing another kind of dry burn.

Chemical burns

Industrial and household chemicals can cause serious burns.

Electrical burns

These can be caused by the everyday low-voltage currents found in switches, wires, appliances around the home or from the high-voltage cables scattered around the countryside in the form of power lines, subway tracks, and so forth. In rarer cases electrical burns can be caused by lighting strikes.

Radiation burns

While this may sound dramatic, most of us have suffered some degree of radiation burn at some point in our lives—more commonly known as sunburn.

DEPTH OF BURN

First degree burns

Involve only the outer layer of skin and, although often extremely painful, are generally not life-threatening unless a very large surface area of the body is covered. The burned area is very sore and is usually red and possibly a little swollen. If good first aid treatment is applied and the area burned is not extensive, then further medical treatment is unlikely to be needed.

Second degree burns

Include the top layers of skin and involve blistering. They are characterized by red, raw-looking skin, blisters that weep clear fluid, and pain. The risk of shock is high with second degree burns and any burn of this type needs medical attention. Second degree burns covering a substantial percentage of the body can kill.

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Third degree burns

Involve damage to all the layers of skin, usually including the nerve endings and other underlying tissues and organs. Characterized by charred tissue often surrounded by white waxy areas of dead skin with damaged nerves, third degree burns will always need emergency medical attention and in the long term will often require plastic surgery.

AREA OF THE BODY BURNED

Generally, the larger the area of the body burned, the more serious the burn. Any burn to the face or neck needs urgent medical attention. As a generalprinciple, if the victim has other injuries, appears to be in a great deal of pain, is showing signs and symptoms of shock, is having difficulty breathing, or you have other reasons to suspect that his or her condition is more serious, then call an ambulance whatever the extent or depth of the burn.

HOW DO YOU TELL HOW SEVERE A BURN IS?

Many burns are minor and can be safely treated at home or with help from local doctor or pharmacist. However the size of the burn will tell you if it needs urgent medical treatment.

The general principle of treating burns remains to cool and cover the affected area but some types of burn need extra consideration. With burns to the neck and mouth, beyond the risk of shock and infection, the greatest potential problem is the risk of airway obstruction due to swelling. The obvious additional danger with electrical burns is the combination of water as a treatment and electricity as the cause.

TREATING THE BURNS TO THE NECK AND MOUTH

1. Check the victim's airway and breathing and be prepared to resuscitate if necessary.
2. Call an ambulance and reassure the victim until help arrives.
3. Get the victim into a position where his breathing is comfortable (this will usually be sitting up).
4. Loosen any constriction around the neck to ease breathing. Keep the airway clear.
5. Cool any burns continuously—do not attempt to cover.
6. Maintain a check on the victim's airway and breathing.

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LIGHTNING

Although rare, lightning strikes do happen and can kill. If caught outside in a thunderstorm, seek shelter in a car or building.

If there is no shelter, make yourself as low as possible, minimize your contact with the ground by crouching and avoid single trees, bodies of water, and tall objects.

If a person has been struck by lightning, check the airway and breathing, be prepared to resuscitate, treat any burns, and call for help.

ELECTRICAL BURNS

If a victims has suffered from an electric shock, do not attempt to touch the person unless you are absolutely certain that he or she no longer in contact with the live equipment. If the person is still attached to an electrical current, your best option is to turn the electricity off at the main breaker. If you cannot access the breaker, you may able to turn off electrical equipment at the wall socket but be particularly careful that you do not touch the victim or any live equipment.

If there is no way to turn the electricity off, you can attempt to move the victim away from the point of contact using a non-conducting material such as a broom handle. Be sure to insulate yourself as much as possible by wearing rubber gloves and shoes, and by standing on a telephone directory.

Electricity demands respect—if in doubt, call in professional help. Do not push yourself in any danger.

TREATING ELECTRICAL BURNS

A victim suffering from an electrical burn may well have respiratory or circulatory difficulties. An electrical discharge across the heart can make the heart stop beating, so be prepared to resuscitate the victim over and above the treatment of any burn that may be present.

1. Make absolutely sure that there is no further risk from the electricity.
2. Check to see whether the victim is conscious, if unconscious, check airway and breathing and take action as appropriate.
3. Treat any burns with cold water if safe to do so.
4. Cover burns as appropriate with sterile, non-fluffy dressings.
5. Seek urgent medical attention. Stay with the victim and reassure him until medical help arrives.

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HIGH-VOLTAGE ELECTRICITY

High-voltage electricity (power lines, subway tracks, overhead power cables, etc.)

Usually kills immediately, causing severe burns, heart problems, and potentially even broken bones and internal injuries as the victim is thrown by the shock. If somebody has been hit, your first priority is to keep yourself and the other bystander safe. High-voltage currents can jump some distance so keep people back at least 60 feet and call for professional help.

Chemical burns and eye burns

While the general rules for the treatment of burns are the same, regardless of the type of burn, there are some additional considerations for chemical burns. The key point when dealing with chemicals is not to contaminate yourself. Chemical spills are not always obvious—some very toxic chemicals look like water—so look for sign such as a HAZMAT (hazardous material) label, empty chemical containers, or guidance from bystanders. If in doubt, call help rather than approach the injured person yourself. Remember that some household substances, particularly cleaning materials such as oven cleaner, can cause chemical burns.

TREATING CHEMICAL BURNS

1. If you feel that you can safely approach the victim, then do so carefully.
2. If necessary, wear protective clothing to protect yourself from contamination.
3. Ventilate the room if possible because many chemicals affect breathing.
4. When cooling the burn with water drains away from both the victim and yourself. It may be necessary to flood the injured part for longer to ensure that the chemical is totally washed away. This take more than 20 minutes.
5. Call help. Make sure you have mentioned that it is a chemical burn so that the additional help can be sent for if necessary and so that any antidotes can be sent with the ambulance.
6. If possible, remove contaminated clothes from the victim because this may keep burning, but only do this if you can do it without contaminating yourself or causing the victim more harm.
7. Cover the burn with a clean, non-fluffy material as appropriate and tie loosely in place if necessary.

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8. Treat for shock and reassure the victim until emergency help arrives the scene.

WHAT IF THE CHEMICALS REACTS WITH WATER?

Some industrial chemicals do not react badly with water. Where such chemicals are used, people working with them should have been trained in the use of an antidote. If there is nobody around with the expertise, do not waste time looking for an antidote—apply liberal amounts of water to try to wash the chemical away.

CHEMICAL BURNS TO THE EYE

Chemical burns to the eye can be very serious. Early rinsing of the eye with cold water will help flush away the chemical and reduce scarring.

TREATMENT

1. Protect yourself, the victim, and bystanders from further contamination.

2. Hold the affected eye under cold running water for at least 10 minutes to flush out the chemical, allowing the injured person to blink periodically. You may need to hold the eyelid open. Make sure that the water flow is gentle. Do not allow contaminated water to fall across the good eye and so contaminate that eye also.

3. Ask the injured person to hold a non-fluffy sterile or clean pad across the eye, tying it in place if hospital treatment may be delayed.

4. Take or send the person to hospital with details of the chemical if possible.

SIGNS AND SYMPTOMS OF CHEMICAL BURNS TO THE EYE

- Known exposure to the chemical
- Intense pain
- Redness and swelling
- Reluctance or inability to open the eye
- Tears from the eye

FLUSH BURNS TO THE EYE

Caused by looking into very bright light, flash burns damage the surface of the

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cornea, the transparent front of the eyeball. Recovery can take some time and in some instances the damage can be permanent (for example, if a person has looked at the sun through a telescope without appropriate protection).

TREATMENT

1. Check the history to rule out chemical burns or a foreign body in the eye.
2. Reassure the injured person, and wear gloves to prevent infecting the eye.
3. Place pads over both eyes and bandage in place if it will be some time until medical help arrives. Remember that this will effectively blind the person temporarily so stay with her to reassure and guide.
4. Take or send the person to hospital because she will need medical attention.

SIGNS AND SYMPTOMS OF FLASH BURNS TO THE EYE

- Known exposure to intense light (which may happened some time ago)
- Intense pain
- Feeling that there may be something in the eyes
- Redness and watering
- Both eyes affected

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Rescue and Transport of Casualty

After evaluating the casualty's illness or injury and administering first aid, you may need to decide the most effective means of transporting a casualty. Casualties moved by manual carries must be carefully and correctly handled; otherwise, moving the casualty could result in additional injury. Manual carries are often used to transport casualties in tactical situations. Your choice of which type of carry to use depends upon the seriousness of the illness or injury, the weight of the casualty, the strength of the carrier (s)), and the distance to be traveled. Using a two-man carry benefits the casualty and the bearers by spreading the load. Improvised litters are the preferred method when the distance may be too far for manual carries or the casualty has an injury that may be aggravated by manual transportation. These litters are for emergency measures and must be replaced by a standard litter at the first opportunity.

ONE-MAN CARRIES

CHOOSE THE APPROPRIATE METHOD TO MOVE A CASUALTY

If you need to move (evacuate) a casualty to an aid station or collection point, you must decide which evacuation method is appropriate. The following are general rules. (The rules are listed in order of most likely to be used.)

CAUTION: Do not transport a casualty with a suspected fracture of the neck or back unless a life-threatening hazard is in the immediate area. Wait until medical personnel arrive.

If no other help is available, use an appropriate one-man carry to move the casualty.

If a litter cannot be used (no time, no materials) and another person is available to help carry the casualty, use an appropriate two-man manual carry to move the casualty.

If a standard litter is not available and if the time, materials, and litter bearers are available, construct and use an improvised litter. A door, ladder, cot, bench, chair, or similar objects can be used as an improvised litter.

If the casualty is to be moved, use a standard litter if one can be obtained and two or more litter bearers (including yourself, if applicable) are available. A litter allows a casualty to be moved a greater distance than do manual carries. Also, a casualty is less likely to aggravate existing injuries or to suffer additional injuries if a litter

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is used.

If possible, use a vehicle to transport the casualty.

CHOOSE AN APPROPRIATE ONE-MAN CARRY

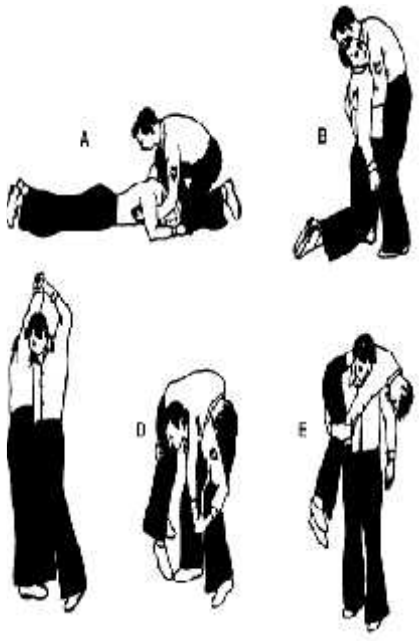
Manual carries are tiring to the bearer. Choose an appropriate carry based upon the casualty's condition, the nature of the casualty's injury, the situation, the distance to be covered, the weight of the casualty, your strength and endurance, and obstacles that will be encountered.

1. PERFORM THE FIREMAN'S CARRY

Raise the casualty to a standing position.

Grasp the casualty's wrist and lift his arm over his head while continuing to support the casualty with your other arm.

> **CAUTION:** If the casualty has an injured arm, grasp the wrist of the uninjured arm.



Bend at the waist and kneel, pulling the casualty over your shoulder. At the same time, slip your arm from his waist, pass the arm between the casualty's legs, and grasp behind the casualty's knee.

Move the hand grasping the casualty's wrist to the hand at the casualty's knee. Grasp the casualty's wrist with the hand at the casualty's knee, freeing your other hand.

Place your free hand on your knee and slowly rise to a standing position. Use the hand on your knee to help you rise without straining your back .Adjust the casualty's body so his weight is distributed comfortably.

Move forward, carrying the casualty.

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2. PERFORM THE SUPPORT CARRY

Position the casualty in a sitting position.

Bend down at the casualty's side so that you are facing in the same direction as the casualty.

> **CAUTION:** If the casualty has an injured leg, position yourself so that the injured leg is next to you.

Bring the casualty's near arm over your shoulder and grasp his wrist with your hand that is away from the casualty. Put your near arm around the casualty's waist. Stand up, helping the casualty to rise to a standing position also. Assist the casualty to walk or hop on one leg. Adjust your walking motion as needed to help the casualty maintain his balance.

3. PERFORM THE ARMS CARRY

Raise the casualty to a standing position. Slide one of your arms under the casualty's arm, behind his back, and under his other arm. Move to the casualty's side, bend down, and place your other arm behind the casualty's knees. Lift the casualty from the ground and stand erect. Carry the casualty high on your chest to lessen fatigue.

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4. PERFORM THE SADDLEBACK CARRY

Raise the casualty to a standing position. (Since the casualty is conscious, he may be able to rise with assistance.)

Grasp the casualty's wrist and lift his arm over his head while continuing to support the casualty with your other arm. Turn so that your back is to his front and bring his arm over your shoulder. Support the casualty's waist with your other arm, if needed.

Have the casualty put his other arm around your neck. If possible, he should grasp one of his wrists with his other hand. Stoop and move your arms back and around the outside of the casualty's thighs .Bring your hands inside of his thighs to your sides, lifting the casualty's thighs.

Stand up and clasp your hands together in front of you. Adjust the casualty's weight to make the weight distribution more comfortable and walk forward.

5. PERFORM THE SADDLEBACK CARRY

Raise the casualty to a standing position. Grasp one of the casualty's wrists and lift his arm above his head while continuing to support the casualty's waist with your other arm. Turn and bring the casualty's raised arm over your shoulder as you turn so that your back is to the casualty's front. Bend your knees somewhat so that your shoulder fits under his arm.

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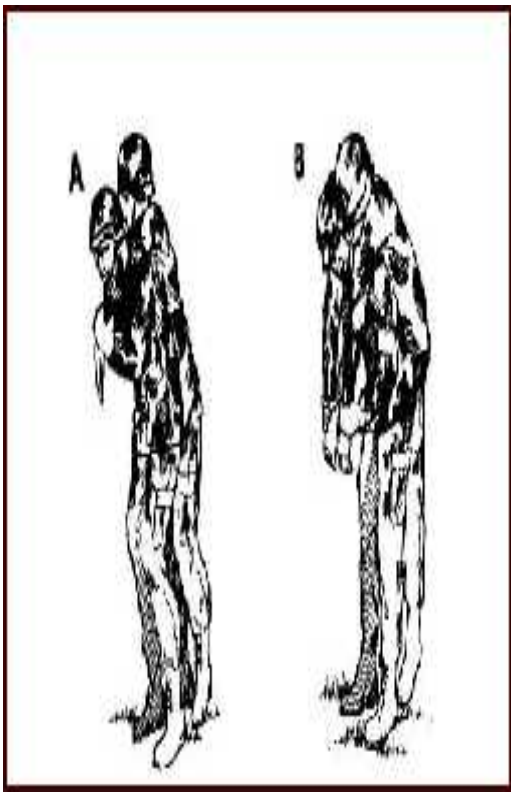
Turn and bring the casualty's raised arm over your shoulder as you turn so that your back is to the casualty's front. Bend your knees somewhat so that your shoulder fits under his arm.



Release his waist, grasp his other wrist, and bring that arm over your other shoulder.

> ***CAUTION:*** *Hold both wrists so that his hands are in a palms down position (palms toward your abdomen). Twisting his hands could result in injury to the casualty's wrists, elbows, or shoulders when he is lifted and carried.*

Bend forward and hoist the casualty as high on your back as possible so that his weight is resting on your back.

Walk forward, keeping bent so that the casualty's weight is balanced on your back and his feet are not dragging.

6. PERFORM THE NECK DRAG

Tie the casualty's hands together with material that will not cut his wrists, such as the casualty's field dressing or a cravat. Do not tie the materials tight enough to interfere with blood circulation. If the casualty is conscious, have him interlock his fingers. Face the casualty's head and straddle his hips on your knees. Loop the casualty's arms around your neck. Crawl forward on your hands and knees, dragging the casualty beneath you.

> ***CAUTION:*** *If the casualty is unconscious, keep his head from dragging on the ground.*

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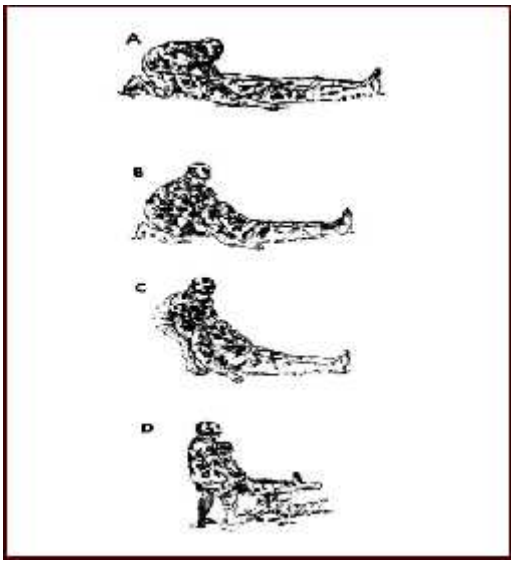
7. PERFORM THE CRADLE DROP DRAG



Position the casualty on his back.Kneel at the casualty's head.Slide your hands (palms up) under his shoulders and grasp the clothing under his armpits.Partially rise so that the casualty is pulled to a semi sitting position. Support his head on one of your arms. If possible, bring your elbows together and use both forearms to support the head.Rise to a stooped position and drag the soldier backward.

> ***CAUTION:*** *If you are going down steps, walk down them carefully going backward. Support the soldier's head and shoulders, letting his hips and legs drop from step to step.*

TWO MAN CARRIES

MOVE A CASUALTY USING THE TWO-MAN FORE-AND-AFT CARRY

Sometimes, a litter is not available and cannot be improvised. In such cases, manual carries may be used to evacuate the injured soldier. A two-man manual carry is usually preferred over a one-man manual carry. The two-man fore-and-aft carry can be used to move a conscious or unconscious casualty. It is not as tiring as other carries; therefore, it is usually the preferred two-man carry for moving a casualty for a long distance. Position the casualty on his back with his arms by his sides. The taller of the two bearers kneels at the casualty's head and faces toward the casualty's feet. He then slides his hands under the casualty's arms and across the casualty's chest. Then he locks his hands together over the casualty's chest. The second bearer spreads the casualty's legs and kneels between the casualty's legs with his back to the casualty's head. He then reaches down and places his hands under the casualty's knees. Both bearers rise together and lift the casualty. Bearers walk forward with the casualty.

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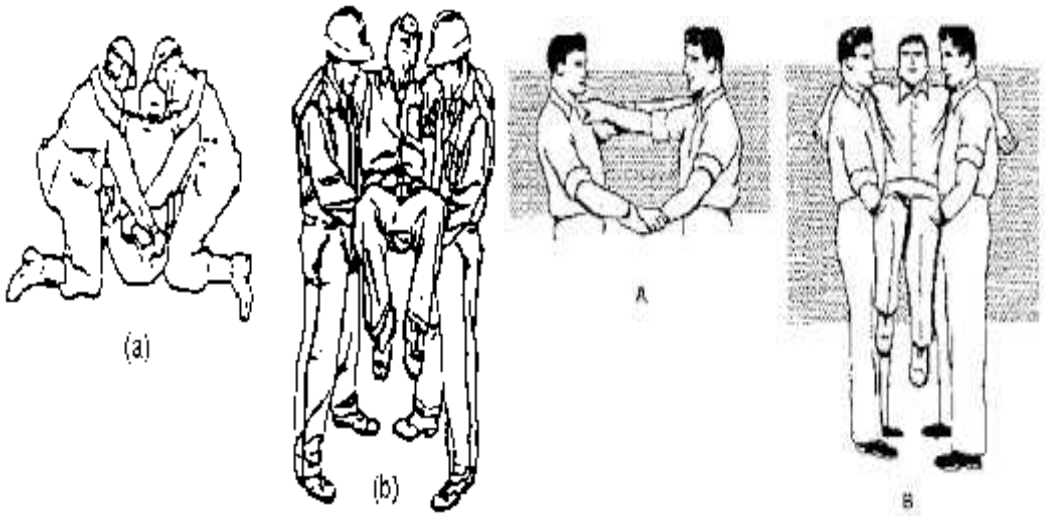
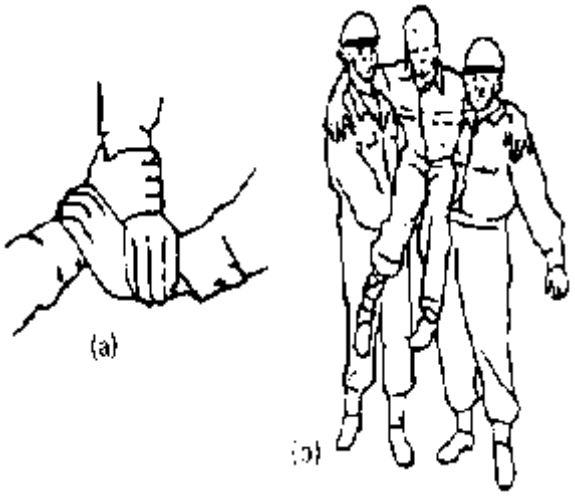
MOVE A CASUALTY USING THE TWO-MAN SUPPORT CARRY



Three hand seat **Four hand seat**



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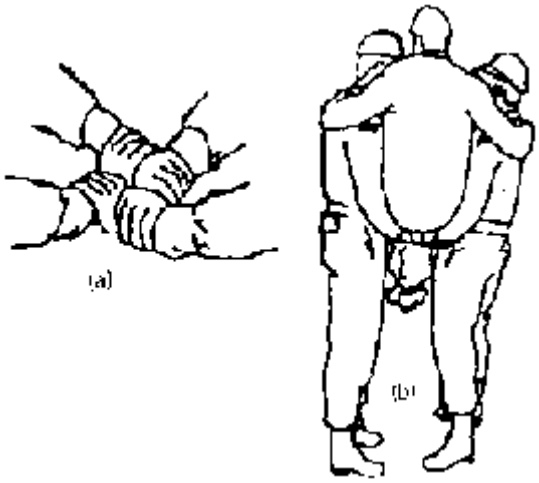
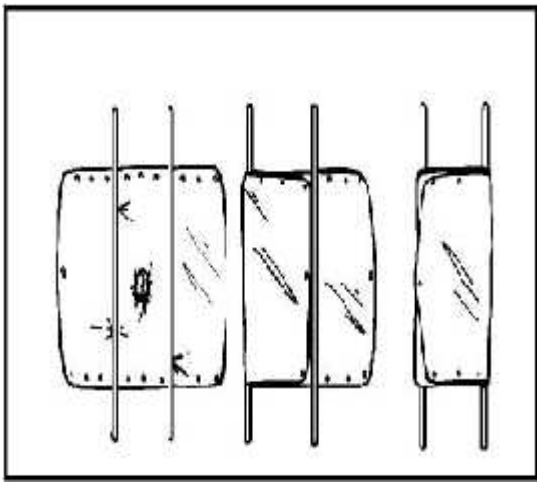


STRETCHER CARRY

HOW TOMAKE AN IMPROVISED POLE AND PONCHO STRETCHER



An improvised stretcher can be made using two tent poles and a poncho. Variations of this stretcher include using straight tree limbs or other rigid objects for the poles. When the casualty is placed on the stretcher, his weight will hold the stretcher together. Open the poncho and lay it flat on the ground. Lay two poles lengthwise across the poncho so that the poncho is divided into thirds. Reach in and pull the hood toward you and lay it flat on the poncho. Make sure that the draw strings are not hanging out of the hole. Fold one outer third of the poncho over the pole. Fold the other outer third of the poncho over its pole.

HOW TO MAKE AN IMPROVISED POLE AND JACKET STRETCHER

An improvised stretcher can be made using two tent poles and two or three field jackets. Tree limbs or other straight, rigid objects can be used instead of the poles. Heavy shirts or other jackets can be used instead of field jackets.

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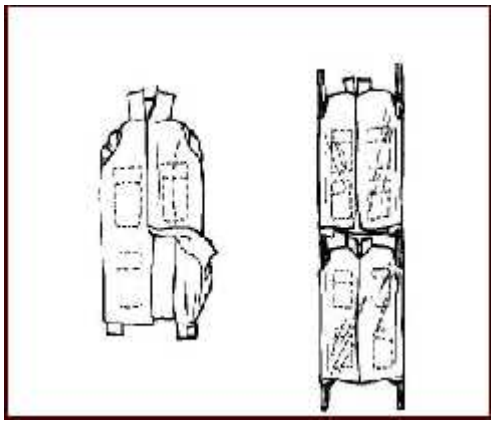
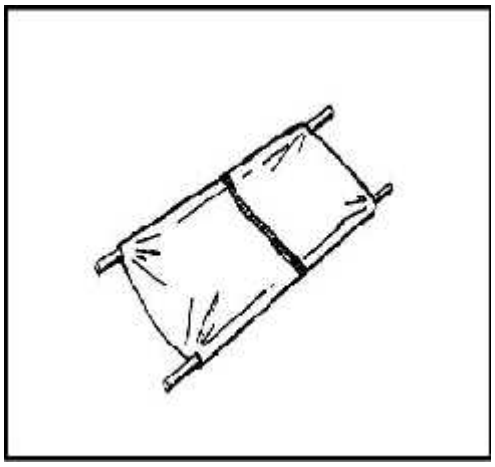


Close (zip or button) the jackets (or other garments).

Turn the garments inside out, but leave the sleeves inside. (Turning the garments inside out puts buttons and zippers inside and keeps them from getting snagged on bushes or other obstacles.)

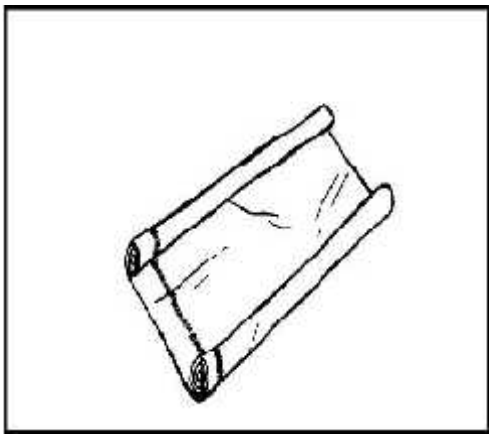
Pass the poles through the sleeves.

HOW TO MAKE AN IMPROVISED POLE AND SACK STRETCHER



An improvised stretcher can be made using two tent poles or similar rigid objects and two empty heavy-fabric sacks such as potato sacks. Cut holes in the two corners of the closed end of each sack. Place the sacks lengthwise so that the open ends of the sacks are facing each other. Slide the poles or limbs through the holes. Overlap the open ends of the sacks about three inches to provide extra strength in the middle of the stretcher.

HOW TO MAKE AN IMPROVISED BLANKET STRETCHER



An improvised stretcher can be made using only a blanket or similar material. The blanket is laid on the ground. Two opposite edges of the blanket are then rolled toward the middle. When the casualty is placed on the blanket, the rolled edges of the blanket are used as grips. Four or more stretcher bearers should be used when transporting a casualty using the blanket stretcher.

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Neil Robertson stretcher

The Neil Robertson stretcher is designed for removing an injured person from spaces wherein access, doors, or hatches are too small to permit the use of regular stretchers. Spaces such as

engine-room spaces, Cargo holds, Pump rooms, Boiler room etc. are few examples of such compact spaces on ship. The Neil Robertson stretcher is made of flexible semi rigid canvas and can be folded easily when not in use or during accessing small spaces.

The stretcher is provided with strong straps which when firmly wrapped around the victim, give strong support to hold the person with almost negligible movement with respect to stretcher, which is very important when rescuing or transferring injured person. The stretcher straps are such made that when tied up over the victim, it covers the person in mummy-fashion, giving sufficient support.

Advantages

- The victim is tied up firmly with the stretcher, avoiding unwanted fall.
- Can be removed vertically from confined spaces like hatches etc, as victim is secured with the stretcher.
- When a life line is tied to the stretcher, unwanted swaying can be avoided.
- Easy to use and bring to the accident site.
- Light weight and ready to use

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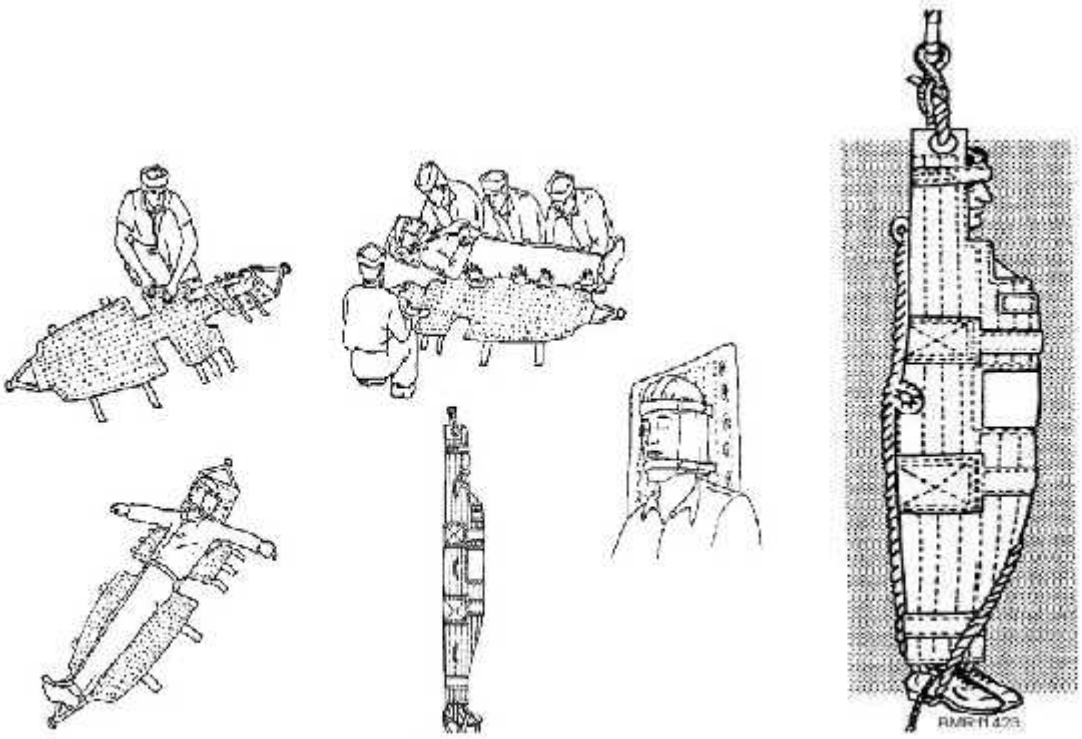

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Other Topics

Poisoning is caused by exposure to a harmful substance. This can be due to swallowing, injecting, breathing in, or other means. Most poisonings occur by accident. Immediate **first aid** is very important in a **poisoning** emergency.

Poisons are substances that can cause temporary or permanent damage if too much is absorbed by the body. Get more information on the effects that different types of poisons have on the body.

Find out how to treat someone for poisoning, understand when you might need to get emergency medical help, and what to do if someone loses responsiveness.

Alcohol poisoning – Can happen when someone has drunk an excessive amount

Drug poisoning – Caused by an overdose of prescription or illegal drugs

Food poisoning – Caused by eating contaminated food

Swallowed poisons – When someone ingests poisonous substances, such as: chemicals, drugs, plants, fungi or berries.

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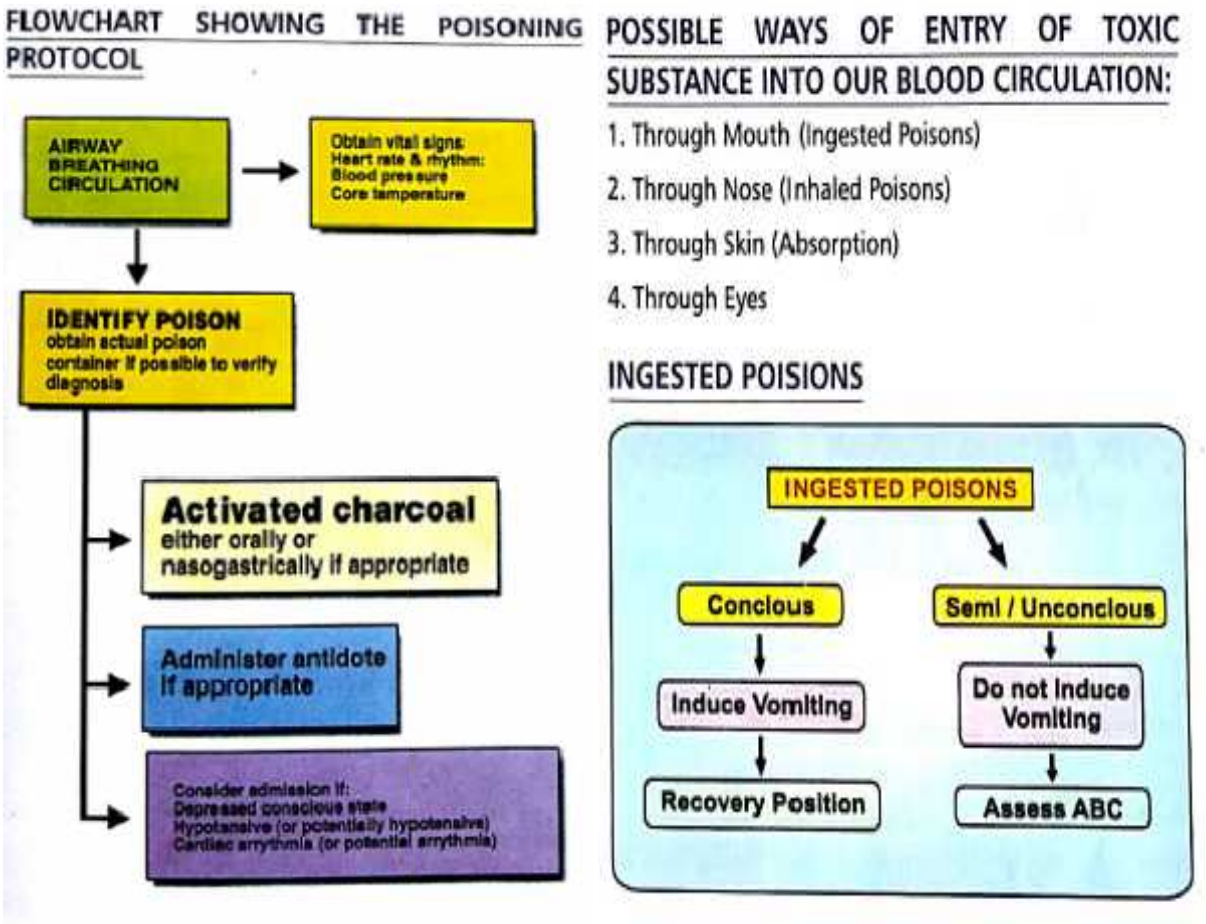

Inhaled poisons

1. Enter with proper berating apparatus.
2. remove the casualty out.
3. check ABC.

THROUGH SKIN

1. Give thorough washing of affected area.

2. Treat the local reaction (Burns)

THROUGH EYES

Check for foreign body before giving eye wash using eye was bottle.

No foreign body	**foreign body is present but not sticking**	**foreign body is present but sticking**

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Give eye wash and put eye drops	**Give eye wash and put eye drops**	**Do not Give eye wash** **Blind fold both eyes** **shift**

Heatstroke

Heatstroke is caused by a failure of the thermostat in the brain which regulates the body temperature. If someone has a high fever or has been exposed to heat for a long time, then their body can become dangerously overheated.

Someone can also get heatstroke after using drugs such as ecstasy.

Sometimes, people get heatstroke after suffering from heat exhaustion. When someone gets too dehydrated they stop sweating which means their body can't cool down anymore, so they develop heatstroke.

Heatstroke can develop with very little warning, causing unresponsiveness within minutes of someone feeling unwell. Your priority is to cool them down as quickly as possible and get them to hospital.

What to look for - heatstroke

These are the six key things to look for:

1. Headache, dizziness and discomfort
2. Restlessness and confusion
3. Hot flushed and dry skin
4. A fast deterioration in the level of response
5. A full bounding pulse
6. Body temperature above 40°C (104°F)

What you need to do - heatstroke

• Quickly move them to a cool place and remove their outer clothing but ensure you maintain their dignity.

• Then call for help.

• Wrap them in a cold wet sheet and keep pouring cold water over it until their temperature falls to at least 38°C (or 100.4°F). Measure this with a thermometer

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under their tongue or under their armpit.

• If you can't find a sheet, fan them or sponge them down with cold water to keep them cool.

• Once their temperature seems to have gone back to normal, replace the wet sheet with a dry sheet.

• While waiting for help to arrive, keep checking their temperature, as well as their breathing, pulse and level of response.

• If they start getting hot again, repeat the cooling process to lower their temperature.

• If they lose responsiveness at any point, open their airway, check their breathing and prepare to treat someone who's become unresponsive.

Frostbite

Frostbite happens when parts of the skin and other tissues freeze due to low temperatures. Frostbite usually affects the fingers and toes as they are the parts of the body furthest from the heart.

If someone has severe frostbite then they might permanently lose all feeling in that part of their body. Frostbite can also lead to gangrene, when the blood vessels and soft tissues become permanently damaged leading to death of the tissue.

Frostbite usually happens in freezing or cold and windy weather. People who cannot move around are more likely to get it. Someone with frostbite will probably have hypothermia, so be prepared to treat them for that too.

What to look for - frostbite

If you think someone has frostbite, there are four key things to look for:

1. 'Pins and needles' to begin with
2. Paleness, followed by numbness
3. Hardening and stiffening of the skin
4. Change in skin colour: first white, then blotchy and blue. On recovery, the skin may be red, hot, painful and blistered. If they get gangrene, the tissue may become black due to the loss of blood supply and death of the tissue.

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What you need to do - frostbite

• First, encourage them to put their hands in their armpits. Then help move them indoors or to somewhere warm.

• Once inside, gently remove anything constricting like rings, gloves or boots.

• Next, warm the body part with your hands on your lap, or under their armpits. Don't rub it though because this could damage their skin tissue. (If there is a danger of it refreezing then don't warm it up yet as this can cause more damage).

• Place the body part in warm (not hot) water at around 40°C (104°F) and be careful not to put it near direct heat as this can cause more damage. Dry it carefully and put on a light dressing, ideally a gauze bandage from your first aid kit.

• Once you've done that, help them to raise their limb to reduce swelling, with cushions or a sling for instance.

• Advise them to take some painkillers if they have some (paracetamol for example).

• Then take or send them to hospital, keeping their limb raised.

Broken bones and fractures

A break or crack in a bone is called a fracture.

In most cases the damage to the bone will be under the skin, which is called a closed fracture, but sometimes bits of the bone can puncture through the skin to become an open fracture.

In both cases you'll need to treat the casualty for shock. Even if you can't see any blood, the break might have caused some internal bleeding.

To break a fully grown bone, a huge amount of force is needed. But bones that are still growing are supple and can split, crack or bend quite easily, a bit like a twig.

What to look for - Broken bones and fractures

The seven things to look for are:

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1. Swelling
2. Difficulty moving
3. Movement in an unnatural direction
4. A limb that looks shorter, twisted or bent
5. A grating noise or feeling
6. Loss of strength
7. Shock

What you need to do - Broken bones and fractures

• If it is an open fracture, cover the wound with a sterile dressing and secure it with a bandage. Apply pressure around the wound to control any bleeding.

• Support the injured body part to stop it from moving. This should ease any pain and prevent any further damage.

• Once you've done this, call for medical help. While waiting for help to arrive, don't move them unless they're in immediate danger.

Waiting for medical help to arrive

Protect the injured area by using bandages to secure it to an uninjured part of the body to stop it from moving. For example, fractures on the arm can be secured with a sling, and a leg with a fracture can be tied to the uninjured leg.

Dislocated joints

A joint is where two bones join or connect. A dislocated joint happens when bones are partly or completely pulled out of their normal position. Joints can dislocate when a strong force wrenches the bone into an unnatural position, or because the muscle violently contracts.

The most common joints that dislocate are the shoulder, knee, jaw, or joints in the thumbs or fingers.

Dislocating a joint can be really painful and cause other damage, like a break in the end of the surrounding bone or tearing of the ligaments around the joint. Sometimes it's difficult to tell whether the injury is a dislocation or a fractured bone. If you're not sure, then always treat it as broken bone.

Don't try to put the dislocated bone back into its socket as you could make it

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worse.

What to look for - Dislocated joints

The four signs of a dislocated joint are:

1. Strong, sickening pain
2. Not being able to move the joint
3. Swelling and bruising around the joint
4. Shortening, bending or deformity of the joint

What you need to do - Dislocated joints

• Advise them to stay still and help them to support their dislocated joint in the most comfortable position.

• Stop the joint from moving using a bandage. For an arm injury, make a sling to support the arm. For a leg injury, use padding or broad-fold bandages.

• To give extra support for an injured arm, tie it in place by bandaging around the sling and the chest.

• Once you've stopped the joint from moving, take or send the injured person to hospital.

• Keep checking their breathing, pulse and level of response. Check the circulation beyond the bandages every ten minutes and loosen if necessary.

Keep checking the casualty for signs of shock. This does not mean emotional shock, but is a life-threatening condition, often caused by losing blood.

If they lose responsiveness at any point, open their airway, check their breathing and prepare to treat someone who's become unresponsive.

Spinal injury

The spinal cord connects the brain to the rest of the body. Together they make up the central nervous system.

The spine is made up of:

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• the spinal cord itself

• the bones that protect the spinal cord (called vertebrae)

• the discs of tissue between the vertebrae

• the surrounding muscles

• and the nerves which branch off it, to carry messages between the brain and the rest of the body in the form of high-speed electric pulses.

The spinal cord connects to individual muscles and tells them to move (called motor function). It also connects to organs like the skin, which communicates feelings like touch, pain and heat (called sensory functions).

The greatest risk if someone has a spinal injury is that their spinal cord will be either temporarily or permanently damaged. If this happens, they'll become paralysed from the point of injury down.

The most common cause of a spinal injury is extreme force, violent twisting or bending forwards or backwards. You should be aware of the possibility of a spinal injury if someone has:

• fallen from a height, e.g. a ladder

• fallen awkwardly, e.g. while doing gymnastics

• dived into a shallow pool and hit the bottom

• fallen from a moving vehicle, e.g. a motorbike, or a horse

• been in a collapsed rugby scrum

• been in a motor vehicle which suddenly crashes

• been hit by a heavy object falling across their back

• had an injury to the head or face.

What to look for - Spinal injury

If you think someone may have injured their spine, these are the seven key things

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to look for:

If the vertebrae (bones protecting the spinal cord) are damaged:
1) pain in the neck or back
2) unusual shape or twist in the normal curve of the spine
3) soreness and/or bruising in the skin over the spine

If the spinal cord is damaged:
4) loss of control over limbs – may not be able to move arms or legs
5) loss of sensation, or abnormal sensations, e.g. burning or tingling
6) loss of bladder and/or bowel control
7) breathing difficulties

What you need to do - Spinal injury

If they're responsive:

• Reassure them and tell them not to move

• Call for an ambulance or ask someone else to call one for you

• You need to stop their head or neck from moving to prevent further damage

• To do this, kneel or lie behind their head. Rest your elbows on the ground or on your knees to keep your arms steady. Grip each side of their head, without covering the ears, to support their head in this position so that the head, neck and spine are in a straight line

• You need to support the head until emergency services can take over, no matter how long it takes for them to come. If there is someone who can help you, ask them to put rolled-up blankets, towels or clothes on either side of the head to help support it.

If they're unresponsive:

• Open their airway using the jaw-thrust technique. To do this, put your fingertips

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at the angles of the jaw and gently lift to open the airway, avoiding tilting the neck

• Then check if they're breathing

• If they're breathing, continue to support their head and call for an ambulance. If you can't maintain an open airway then carefully follow the instructions of how to put someone with a spinal injury in the recovery position.

If they're not breathing, you'll need to start CPR (cardiopulmonary resuscitation)

While waiting for help to arrive, keep checking their breathing, pulse and level of response.

Strains and sprains

Strains and sprains are common injuries which affect the soft tissues around joints – the muscles, tendons and ligaments.

They happen when the tissues are stretched, twisted or torn by violent or sudden movements, for instance if someone changes direction suddenly, or falls and lands awkwardly.

A sprain is when a ligament has been twisted or torn.

A strain is when the muscle has been overstretched and has partially torn. (A rupture is when a muscle or tendon is completely torn).

What to look for - strains and sprains

If you think someone may have strained or sprained a muscle, ligament or tendon, these are the three key things to look for:

1. Pain and tenderness
2. Difficulty moving
3. Swelling and bruising

What you need to do - strains and sprains

Remember RICE for the four steps to deal with strains and sprains:

Rest – Ice - Comfortable support - Elevation

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Treatment for strains and sprains

Step 1 of 4: Rest

Help them to sit or lie down and support in a comfortable raised position the part they've hurt.

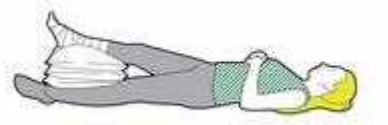
Step 2 of 4: Ice

To cool the area, apply a cold compress, like an ice pack or cold pad. This will help to reduce the swelling, bruising and pain. Do not leave on for more than ten minutes.

Step 3 of 4: Comfortable support

Leave the cold compress in place or wrap a soft layer of padding, e.g. cotton wool, around the area. Tie a support bandage around it, to hold it in place, which goes up as far as the next joint on each side. For example, for an ankle injury, the bandages should go from the base of the toes to the knees.

Step 4 of 4: Elevation



Elevate the injury and support it with something soft, like cushions.

If the pain is severe, or they can't use their limb at all, take or send them to hospital. Otherwise, just tell them to rest it and to see a health care professional, if necessary.

BANDS – BANDAGES – DRESSING

They are used both to hedge or to protect wounds like pressure and control bleeding; entablillamientos to hold packs or to protect a region of impurities and

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shelter her body, and finally to prevent movement of a zone.

General Application Instructions

before applying the bandage should cover the wound with a sterile pad or gauze. Never place the band directly affected because it can lead to infection part. The bandage should be placed firmly, but not so tight as to cause pain or impede circulation. So only it occurs swelling and may even be the cause of gangrene. If you have nothing to hold the bandage when it is already placed, divide the final half centimeters (depending on the size of the body part that is binding) anudelos at the bottom, roll a few times in strips Atelas counterclockwise and then firmly, but without pressing.

To continue Bandages and most common ways to apply and How to use different types of bandages

Types of bandage on First AID techniques: (first aid supplies)
elastic, compression, israeli, finger, hand, pressure, triangle, triangular, conforming, head, butterfly, elastic, medical, knuckle, wound.

1. ADHESIVE BANDAGES (BANDAGES, PATCHES, BANDAGES)

They come in different sizes and serve to cover minor and superficial wounds. Some are already sterilized and bring gauze with antiseptic cream.

Before applying the injured should be washed with soap and water, and then dry with a piece of gauze or a clean cloth. l Put antibiotic ointment or cream and allow to dry for a moment.

Place the bandage directly applying central gauze over the wound, catching and finally removing the plastic ends.

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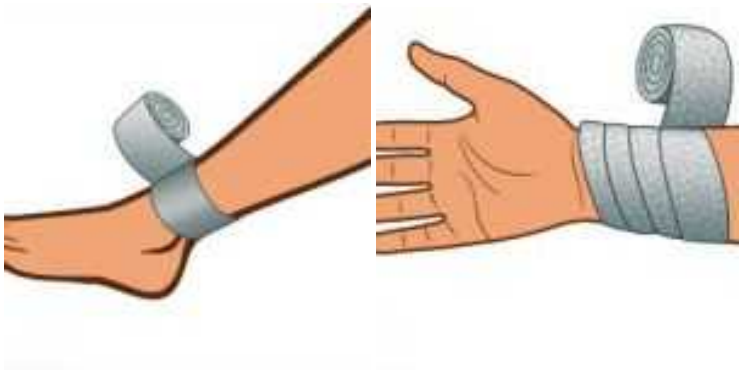
2. BANDAGE ROLLED OR CIRCULAR

Generally, the band will gauze and can be used for lesions in the wrist, ankle, neck, fingers, etc. -Come in different widths depending on the part that is needed bandaging.
You must first secure the start of the band with your left thumb and then wrapping it with two laps to go in the same place so start to hold. Then begin to wind up riding around the other in ¾ There are several methods and techniques to set the bands within which the most common are:
With tape. With a safety pin.
With a loop knot: after finishing the bandage wrap the injured area, leave free approximately 20 centimeters. Then push back the bandage until an end is twofold. Proceed to securely attach the two ends



Was mowing the band: is cut into two the final end, they knotted and wound in the affected part-each one in contrary sense and finally re-boot.
To place a circle in the toes or hands bandage proceed as follows: To ensure the start two laps bandage on the side of the base of the finger, go rolling so to go up and go around overlapping each other in ¼ of the width of the band.

To cover the fingertip pass band a few times on the basis of the finger tip and crossing to the other side. Hold these last laps with a bandage around them. A firme with pieces of adhesive tape along the finger and mud around these strips. If the finger is injured on the bottom you can hold the bandage on the wrist. Placing it in a figure eight.

SEE various types of dressings with illustrative images

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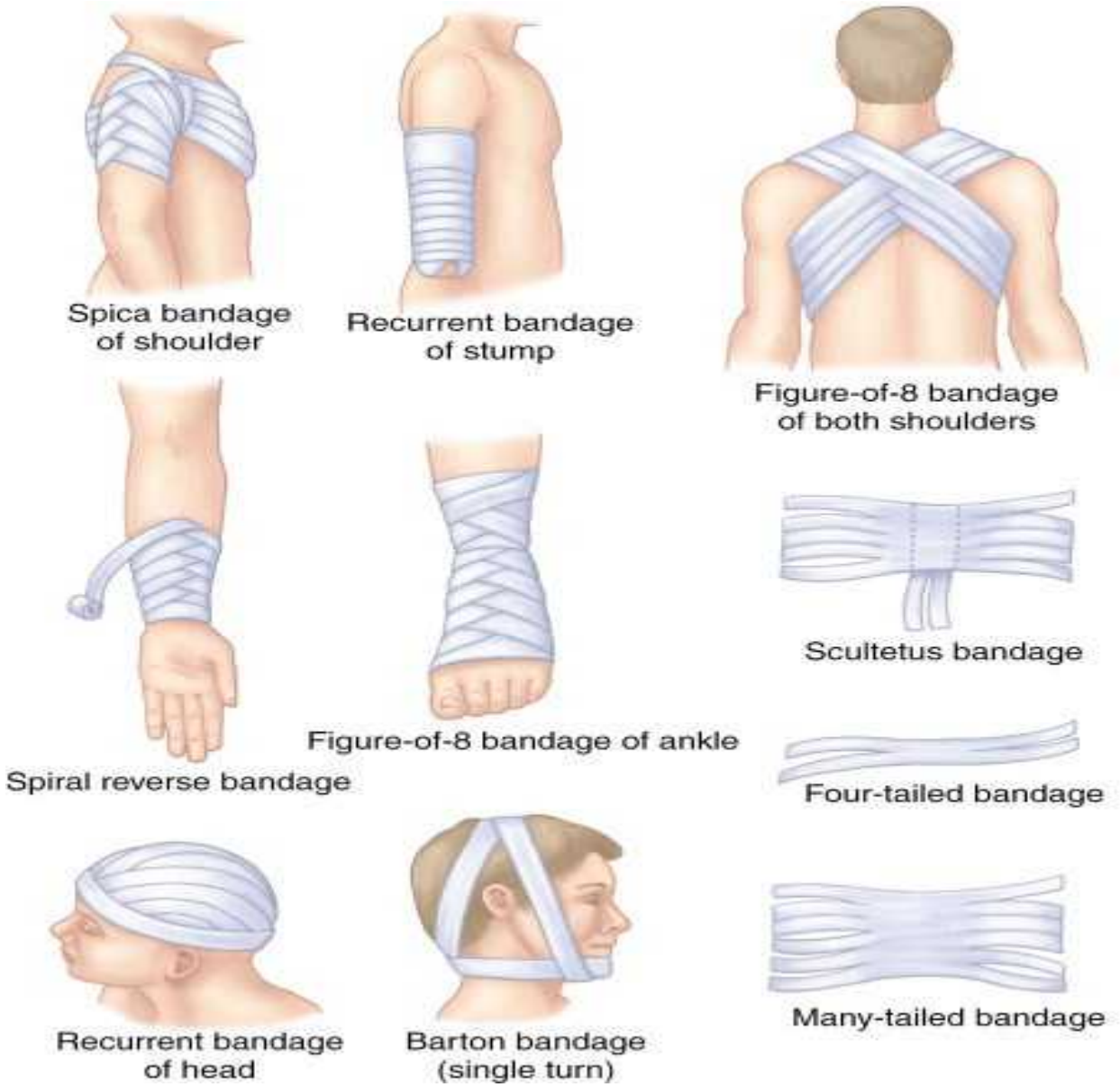

3. TRIANGULAR BANDAGE

This type generally used for bandages tie type to apply a tourniquet or to treat injuries to the head or arms. 7

a) For the head (especially suitable for wounds on the scalp).

• Take the triangle, fold at the bottom and place it on the head, starting from the level of the eyebrows, with the hem out (Fig.1).

• Bring the ends back, crossing them behind his head and put forward to tie them (fig. 2).

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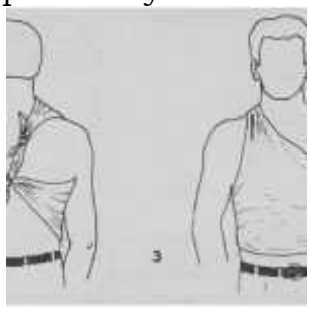
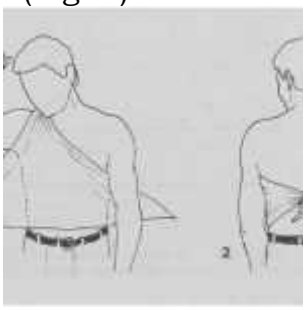
b) To Chest

• Place the tip (apex of the triangle) on one shoulder. It should be the one

• The tip of the triangle that hangs behind the neck pull it up and roll over previously crossed strips. (Fig. 3).





first aid triangular bandage techniques

C) Type tie

Very used for lesions in the jaw, face and ears, among others.

• Take the triangle and bent from the vertex few times as necessary, until the desired width.

• Pass the strap over the injured area, take a drive around the area, cross it and tie it in place of the crossing opposite the mud.

In the case of injury to one or more ribs place Triangular bandages that hung around to the opposite side to the injured area. Lest tighten pads placed under each of the nodes.

4. BANDAGE REVERSE SPIRAL.

Ideal for use in injuries in the legs or forearms.

• The dressing begins two turns on the thinnest part of the area affected (ankle or wrist) (fig. 1).

• Turning the roll of gauze on itself and start another turn (fig. 2).

• By giving every turn, at the same point at the same level it becomes to turn the roll of bandage. And so on.

5. BANDAGE IN A FIGURE EIGHT

Very convenient for injuries in the ankles, knees, wrists, hands or elbows.

• It incia with two laps around the affected part. (Fig. 1).

• Immediately get off at an angle, then riding a seesaw back about a third of the

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other and so on to cover the surface (Fig. 2).

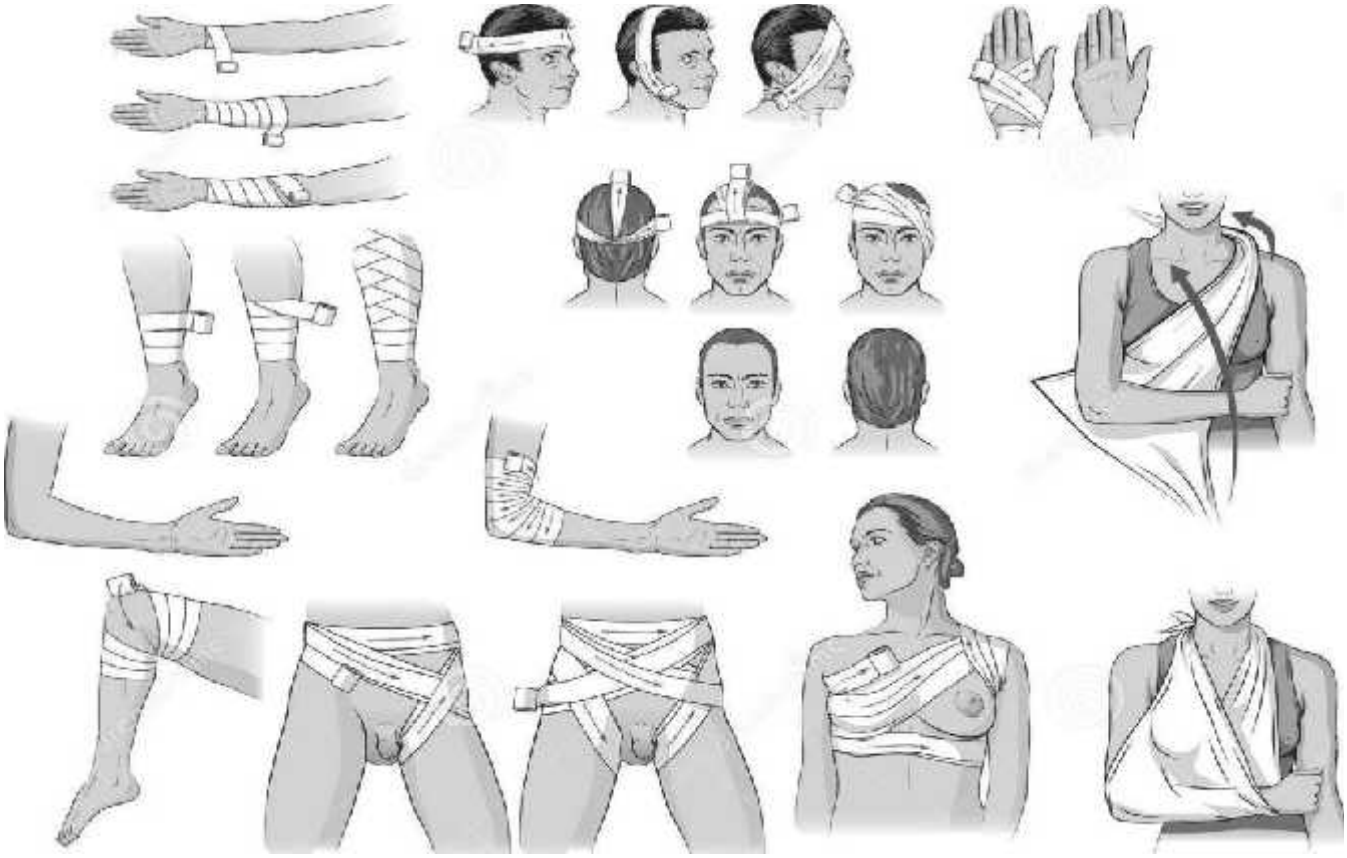
6. TANG DRESSING

For use in groin injuries or shoulder.

• holding the gauze bandage on the opposite side to the injured area and then begins to wrap the region affected groin or shoulder (Fig. 1) part.

• It returns to the starting point passing behind the body (Fig. 2).

• Repeat as necessary to cover the injured area mud.



7. SPECIAL BANDAGES

a) For the jaw

• Surrounding the head with a couple of laps of the band.

• AI get to the side, at ear level, and pass up the band over the head.

• Then lower it and run it through the chin (fig. 2).

• Repeat this a couple of times and secure the bandage with tape.

b) For the head

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• Two bands are attached at the ends and knot is placed in the center rear of the head (Fig. 1).
• Bring the ends forward and cross them in the area of the forehead (Fig. 2).
• Conduct now ends back and cross them in the same part of the initial knot, leaving a strip follow completely encircling the head and the other up (fig. 3).
• Set the band passing-up with around the head and upload again. And continue to cover the entire head (fig. 4).
• Finally a full turn around the head with one end (which comes from above is fixed] and tie a knot in the front (fig. 5).

To continue Bandages and most common ways to apply and How to use different types of bandages

Types of bandage on First AID techniques: (first aid supplies)
elastic, compression, israeli, finger, hand, pressure, triangle, triangular, conforming, head, butterfly, elastic, medical, knuckle, wound.

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FIRE PREVENTION AND FIRE COURSE

HANDOUT

(IMO Model Course 1.20/STCW A-VI/1)

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(Ministry of Shipping, Government of India)
www.dgshipping.gov.in

CONTENT

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A	Content	1	00	01-Feb-2018
B	Revision Record	1	00	01-Feb-2018
C	Course Outline	1-2	00	01-Feb-2018
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03	Fire Prevention	1-7	00	01-Feb-2018
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08	Fire Fighting Methods	1-3	00	01-Feb-2018
09	Fire-Fighting Procedures	1-3	00	01-Feb-2018

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Section	Details of Revision	Revision No.	Date

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FIRE PREVENTION & FIRE FIGHTING
COURSE OUTLINE

Duration 3 days

Subject Area	Hours		
	Lecture	**Demo & Practice**	**Films**
Registration			
1. Introduction, Safety & Principles	0.50		
2. Theory of Fire 2.1 Conditions of Fire 2.2 Properties of flammable materials. 2.3 Fire hazard and spread on fire 2.4 Classification of fires and appropriate Extinguishing agents	1.0		0.5
3. Fire Prevention 3.1 Fire prevention principles 3.2 Ship construction arrangements 3.3 Safe practices	1.50		
4. Fire Detection System & Alarms 4.1 Fire and smoke detection systems 4.2 Automatic fire alarm	0.75		
5. Fixed Fire-extinguishing systems 5.1 General 5.2 Smothering Effect Systems: * Carbon-Di-Oxide (Co2), Foams 5.3 Inhibitor Effect Systems: Powders 5.4 Cooling Effect Systems: Sprinklers Pressure Spray 5.5 Emergency Fire Pump 5.6 Chemical Powder Applicants	1.25		
6. Fire Fighting Equipment 6.1 Fire Hoses And Nozzles 6.2 Mobile Apparatus 6.3 Portable Fire Extinguishers 6.4 Fireman's Outfit 6.5 Breathing Apparatus 6.6 Resuscitation Apparatus 6.7 Fire Blankets	1.0	1.5	

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7. Ship Fire-fighting Organization 7.1 General Emergency alarm 7.2 Fire Control Plans And Muster List 7.3 Communications 7.4 Personnel Safety Procedures 7.5 Periodic Ship Board Drills 7.6 Patrol System	0.75		
8. Fire-fighting Methods 8.1 Knowledge Of Fire Safety Arrangements 8.2 Fire Alarms And First Actions 8.3 Firefighting	0.5		1.0
9. Fire-Fighting Procedures	0.5		
10 Fire-Fighting Drills 10.1 Small Fires 10.2 Extensive Fires 10.3 Drills In Smoke-Filled Spaces		4.50	
11. Review and Final Assessment	0.5		
Sub totals	**8.5**	**6.0**	**1.50**
Total		**16.00**	

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1. Aim

This model course aims to provide the training for candidates in fire prevention and fighting in accordance with Section A-VI/1 of the STCW Code.

2. Objectives

This syllabus covers the requirements of the 1978 STCW Convention as amended Chapter VI, Section A-VI/1, paragraph 2 and Table A-VI/1-2. On meeting the minimum standard of competence in fire prevention and fire fighting, a trainee will be competent to take appropriate measures for the safety of personnel and of the ship and to use fire appliances correctly. The trainee will also have a knowledge of fire prevention.

3. Entry Standards

The course us open to all seafarers and prospective seafarers and should be completed prior to employment on a sea-going ship. All trainees must be certified by a doctor to be in good health.

4. Required Attendance

100% attendance is required for successful completion of the course.

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INTRODUCTION SAFETY AND PRINCIPLES

The main aim of annex 2 of Resolution A. 437(XI) are :

- Instruction to officers and key personnel about organizational methods and the best use of staff for combating Fires.
- Training them in the maintenance and inspection of Fire Extinguishing Equipments.
- Safe Methods of Fire Fighting.

The principles of Survival in relation to Fire are:

- Knowledge of Fire Theory and Fire Precautions
- Regular Training and Drills
- Preparedness for any Fire Emergency
- Knowledge of Dangers of Smoke and Toxic Fumes
- Regular Inspection and Maintenance of :
  - Fire Detection Equipments
  - Portable Fire Extinguishing Equipments
  - Portable/ Mobile Fire Extinguishers
  - Fireman's Outfit (including Breathing Apparatus)
  - Emergency Escape Breathing Device (E.E.B.D.)

OBJECTIVES

On completion of this course the Trainee will be able to:

- Minimize the risk of Fire onboard
- Action to be taken in case of Fires
- Maintain a state of readiness onboard to respond to emergency situations involving Fires
- Fight and Extinguish the Fire
- Use all Fire Fighting Equipments correctly
- Knowledge of Routes and Exits and Emergency escapes
- Knowledge of Emergency Alarms

INTRODUCTION "FIRE"---------- "FIRE"---------- "FIRE"

- Shout
- Raise the alarm
- Muster the crew
- Stop spread of fire
- Control & containment

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- Fight the fire

It seems very simple but the frequency of serious Fires and the incidence of ship losses by fire is higher than any other cause.

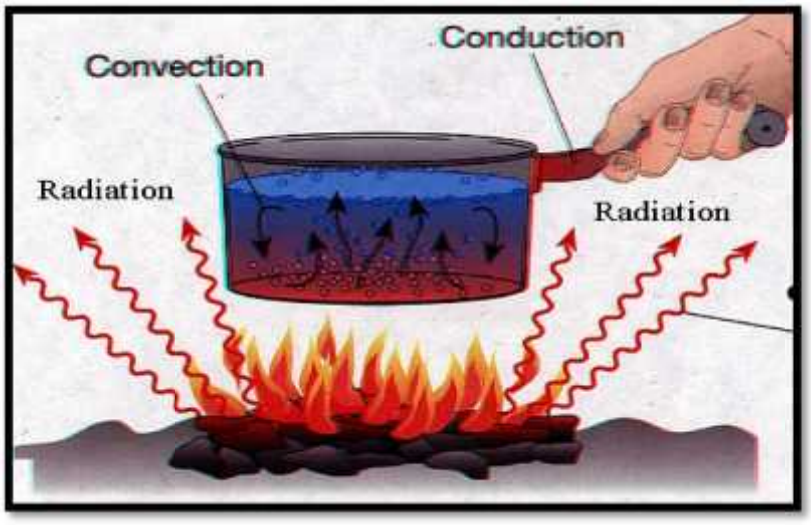
The problems of Fire Prevention and Fire Fighting onboard ships need more systematic and organized approach to Fire Fighting techniques including the correct use of equipments and more effective Fire Fighting drills.

There is a general need to enhance and upgrade the standards of training, to improve management skills in organization of Fire Fighting and to enhance the understanding of Fire Prevention measures onboard.

Investigations in the causes of accidents have revealed that the great majority of accidents result from Human weakness, even those which are attributed to technical failure usually reveal some lapse in the Man supervision of the machine. Perhaps by inadequate design, maintenance or operation. Major causes of accidents have been categorized as :

- Human Error 88% (Ignorance & Negligence)
- Material / Machinery Failure 10% (Human Factor to certain extent)
- Act of God / Nature 2% (Weather, Lightening, Earthquakes etc.)

SPREAD OF FIRE- Methods of heat transfer



CONDUCTION - Transfers the heat within a substance from high temperature, by direct contact between the particles of solid. By means of elastic waves, heat

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energy is passed from one molecule to the next.

CONVECTION- Is the process of heat transfer from one location to the next by the movement of fluids. The moving fluid carries energy with it. The fluid flows from a high temperature location to a low temperature location.

RADIATION- The transfer of heat by radiation involves the carrying of energy from an origin to the space surrounding it. The energy is carried by electromagnetic waves and does not involve the movement or the interaction of matter. Thermal radiation can occur through matter or through a region of space that is void of matter (i.e., a vacuum). In fact, the heat received on Earth from the sun is the result of electromagnetic waves traveling through the *void of space* between the Earth and the sun.

PRINICIPLES OF SURVIVAL IN FIRE

- Knowledge of Fire Theory
- Regular training
- Preparedness for fire emergency
- Knowledge of escape routes
- Knowledge of dangers
- Regular inspection and maintenance
- Fire alarm and fire detectors
- Fixed extinguishing equipments
- Portable/ mobile extinguishers
- Breathing apparatus
- Fireman's outfits

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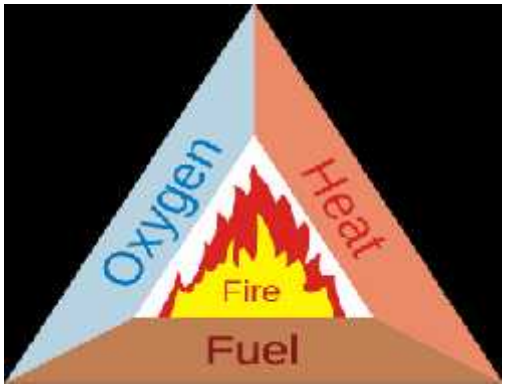
THEORY OF FIRE

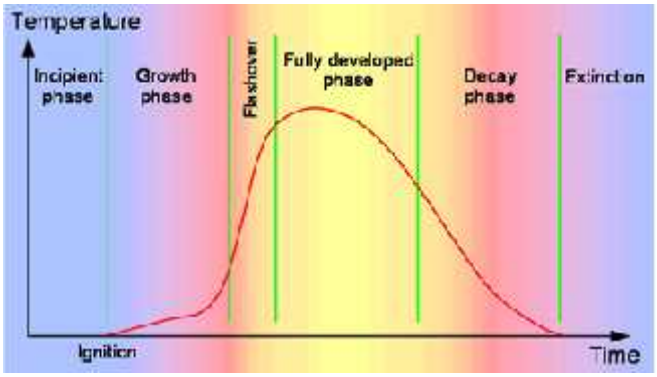
Conditions required for a Fire to occur are –

- The presence of material, which act as a fuel
- A source of Ignition eg. Chemical, biological or physical
- The presence of oxygen, in air or from oxidizing agents

Three conditions can be represented as triangle.



FIRE TRIANGLE

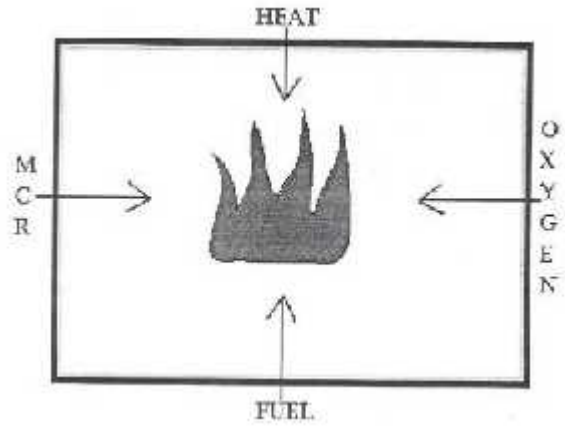


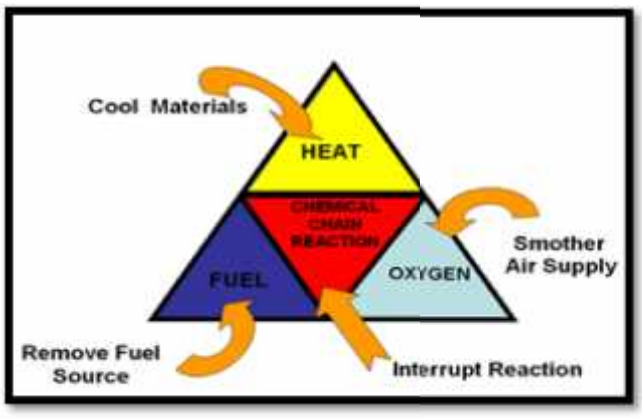
PHASE OF FIRE DEVELOPMENT

A fire requires three basic components – fuel, air and heat.

FIRE SQUARE/TETRAHEDRON

Fire square is having four sides /elements.





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MCR (MOLECULAR CHAIN REACTION)

- It is a continuous process of burning substances
- It is continuous process of burning vapors'
- Exothermic chemical reaction generates heat

FIRE

Fire is a chemical reaction of burning substance with oxygen with emission of heat, light and flame. (It produces heat and light)

PHASE OF FIRE DEVELOPMENT

INCIPIENT – This first stage begins when heat, oxygen and a fuel source combine and have a chemical reaction resulting in fire. This is also known as "ignition" and is usually represented by a very small fire which often (and hopefully) goes out on its own, before the following stages are reached. Recognizing a fire in this stage provides your best chance at suppression or escape.

GROWTH – The growth stage is where the structures fire load and oxygen are used as fuel for the fire. There are numerous factors affecting the growth stage including where the fire started, what combustibles are near it, ceiling height and the potential for "thermal layering". It is during this shortest of the 4 stages when a deadly "flashover" can occur; potentially trapping, injuring or killing firefighters.

FULLY DEVELOPED – When the growth stage has reached its max and all combustible materials have been ignited, a fire is considered fully developed. This is the hottest phase of a fire and the most dangerous for anybody trapped within.

DECAY – Usually the longest stage of a fire, the decay stage is characterized a significant decrease in oxygen or fuel, putting an end to the fire. Two common dangers during this stage are first – the existence of non-flaming combustibles, which can potentially start a new fire if not fully extinguished. Second, there is the danger of a back draft when oxygen is reintroduced to a volatile, confined space.

FULL FORM OF WORD "FIRE" -

F - Find

I - Inform

R - Restrict

E - Extinguishments / Escape

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FIND

- Type of Fire
- Place of Fire
- How long
- Any casualty / trapped

INFORM TO CONTROL STAION

- By shouting "FIRE, FIRE, FIRE"
- By Fire Alarm
- By telephone, walkie / talkie, Radio sets
- By messenger

RESTRICT - Stop spreading of fire to unexposed side of compartment, different ways and means are adopted to restrict fire depending on place of fire, type of fire.

EXTINGUISHMENT

- By removing Oxygen – Smothering
- By removing Heat – Cooling
- By removing Fuel – Starving
- By cutting MCR – Inhibiting (B.C.R.)

Use proper Extinguishing Media, (Must know reactivity of extinguishing media on burning substances.)

NOTE- If fire is not able to be extinguished escape from location of fire.

SOURCE OF HEAT / IGNITION

A source of ignition is required for combustion to occur. Fire Prevention and Extinguishments depend on the control of heat or heat energy source. Heat energy can be produced –

- Chemical Heat Energy – Exothermic Reaction, Decomposition, Combustion and Spontaneous Combustion
- Mechanical Heat Energy – Friction
- Electrical Heat Energy – Sparks, Heat Conductors
- Solar Heat Energy – sun rays
- Biological – food waste, grains

Fire can be extinguished by removing anyone of three elements of fire triangle.

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By removing heat (cooling), by removing Fuel (starving), by removing Oxygen (smothering), and by removing or stopping M.C.R. (inhibiting/ breaking chain reaction)which is shown in tetrahedron.

When a fire occurs in an enclosed space the hot gases rise to the ceiling, where they spread out to form a hot layer (incipient phase of fire). As the fire proceeds, this layer increases in depth and temperature keeps on increasing (free burning speed). When all of the available oxygen has been consumed the fire dies down to a smoldering mass with the atmosphere above consisting of combustion gases and unburned vapors at or above their ignition temperature. If fresh air finds its way to the compartment through any opening, the unburned vapor bursts into flame with almost explosive force. This phenomenon is termed as flash over and it gives new life to the dormant fire leading to a much greater catastrophe.

FLAMING FIRES - Result from the ignition of items such as flammable liquids, wood or paper, cooking accidents, or from open flames such as candles that ignite other items. They produce large quantities of flames and lesser visible amounts of smoke.

Flaming combustion involves gaseous fuel mixing with air, reacting with oxygen and releasing heat. The combustion process produces a variety of gases (CO2, CO, H2O etc.) as well as particulate matter known generally as smoke. Regardless of whether the fuel was originally a liquid or solid, the overall burning process must gasify the fuel. With liquids, the supply of gaseous fuel is a result of evaporation at the surface from the heat generated by the flames. Solids entail a significantly more complex process involving chemical decomposition (pyrolysis) of large polymeric molecules. Certain combustible solids such as sodium, potassium, phosphorus, and magnesium can be oxidized directly by oxygen in the air without the need of pyrolysis.

SMOLDERING FIRE- Is a flameless form of combustion, deriving its heat from oxidations occurring on the surface of a solid fuel. Common examples are the initiation of fires on upholstered furniture by weak heat sources (e.g. a cigarette, a short-circuited wire).

Smoldering combustion is a condition where all four elements of a fire are present, but are imbalanced. Smoldering combustion exists in conditions where there is a self-sustaining reaction, but the reaction is limited by some of the constituents of the fire “square”. A smoldering fire will not easily change to flaming combustion.

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EVERY YEAR MORE AND MORE SHIPS ARE LOST THROUGH FIRE AND COLLISION. SHIPBOARD FIRE ALONE, HOWEVER, RESULTS IN MORE TOTAL LOSSES OF SHIPS THAN ANY OTHER FORM OF CASUALTY. THE MOST COMMON CAUSES OF SHIPBOARD FIRE ARE THE MOST OBVIOUS. DURING MAINTENANCE BURNING AND WELDING ARE RESPONSIBLE FOR NEARLY 40 PER CENT OF ALL OUTBREAKS. SMOKING LEADS TO COUNTLESS FIRES THAT BREAK OUT WHEN NO ONE EXPECTS. LACK OF ATTENTION, SPONTANEOUS COMBUSTION AND ELECTRICAL FAULTS ARE THE MAJOR CAUSES. THE ENGINE ROOM IS AT SPECIAL RISK FROM FLASHBACKS IN OILFIRED BOILERS, LEAKY PIPINGS CARRYING OIL, OVERHEATED BEARINGS AND EVEN THE ACCUMULATION OF RUBBISH (OIL RAGS, DIRTY OIL, TINS OF OIL, ETC.). FIRE FIGHTING AT SEA INCLUDES THREE DISTINCT STAGES: DETECTION -LOCATING THE FIRE; ALARM- INFORMING THE REST OF THE SHIP; CONTROL –ACTUATING THE MEANS OF EXTINGUISHING THE FIRE.

CLASSIFICATION OF FIRES

SOLAS Ch II-2 Reg 10.3.2 leaves the types and numbers of extinguishers, where not otherwise specified, to the satisfaction of the administration. On SOLAS ships built after 1 January 2009 extinguisher provision and distribution should be as set out by MSC Circular 1275, as interpreted in the tables 1 & 2 below. Note that the class of extinguishers used in MSC Circular 1275 is that used by the National Fire Protection Association (NFPA) and not the ISO classification.

International Organisation for Standardization (ISO Standard 3941)	**National Fire Protection Association (NFPA – 10)**
Class A – Fire involving solid materials, usually of an organic nature, in which combustion normally takes place with the formation of glowing embers.	Class A – Fires in ordinary combustible materials such as wood, cloth, paper, rubber and many plastics

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Class B – Fire involving liquids or liquefiable solids	Class B – Fire in flammable liquids, oil, greases, tars, oil based paints, lacquers and flammable gases.
Class C – Fire involving gases	Class C – Fire which involve energized electrical equipment where the electrical non-conductivity of the extinguishing medium is of importance. (when electrical equipments is de-energized, extinguishers for class A or B fires may be used safely)
Class D – Fire involving metals	Class D – Fires in combustible metals such as Magnesium, Titanium, Zirconium, Sodium, Lithium and Potassium etc.
Class F - Fires involving cooking oils	Class K - Fires involving cooking fats, oils and grease.

PROPERTIES OF FLAMMABLE MATERIAL

FLAMMABILITY

The ability of a substance to burn vapors given off by a flammable material, can burn when mixed with air in the right proportion in the presence of an ignition source.

BURNING SPEED

Low speed - Combustion Process (Burn slow)
Sub Sonic Speed - Deflagration (flame)
Super Sonic Speed - Detonation (explosion)

FLASH POINT

The lowest temperature at which a liquid gives off sufficient vapors to form a flammable mixture near surface of the liquid. (Fuel having flash point above 60^0 C are generally used onboard ships)

IGNITION POINT

The minimum *temperature* at which a substance will continue to burn without additional application of external heat. Also called kindling *point.*

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FLAMMABLE LIMITS

LOWER FLAMMABLE LIMIT (L.F.L.)
Is any hydrocarbon concentration of vapour in air below which there is insufficient H.C. gas to support combustion.

UPPER FLAMMABLE LIMIT (U.F.L.)
Is any hydrocarbon concentration of vapour in air above which there is insufficient air or oxygen to support combustion.

FLAMMABLE RANGE
The range of flammable concentration (% by volume) in air between the lower and upper flammable limits.

COMBUSTIBLE LIQUID
Defined as liquids having closed cup flash points at or above 100°F (37°C). Combustible liquids are referred to as Class II or Class III liquids.

FLAMMABLE LIQUID
Defined as liquids having closed cup flash points below 100°F (37°C) and vapor pressures not exceeding 40 psi (276 kPa) (2.76 bar) at 100°F (37°C). Flammable liquids are referred to as Class 1 liquids.

PYROLYSIS
Before a solid fuel burns it has to be changed in vapor state and this is achieved by initial heating. This process is known as pyrolysis.

STATIC ELECTRICITY
Refers to the build-up of electric charge on the surface of objects. The static charges remain on an object until they either bleed off to ground or are quickly neutralized by a discharge.
Static electricity is a stationary electric charge that is built up on a material. It is produced by dissimilar materials through physical contact and separation.

BOIL OVER - Is the phenomenon when water is poured or added to a combustible liquid which is burning and has attained a very high temperature, immediately the water being denser than combustible liquid it submerges and converts in to steam at around 1500 to 1600 times of water which expels out the liquid in fine droplets, will immediately get ignited and spreads in form of a explosion which may cause burns to people around, fire may spread around if have combustibles in surrounding.

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BLEVE (BOILING LIQUID EXPANDING VAPOUR EXPLOSION)

A phenomenon of bursting of container having liquid under pressure, when the container gets heated. Due to temperature liquid inside the container gets changed in vapor giving rise to more pressure which may lead to explosion, if the contents are flammable the condition gets worst.

FIRE EXTINGUISHERS – CLASSIFICATION

Extinguishers are classified according to the type of extinguishing medium they contain. At present the types of extinguishers and use of which they are recommended are as follows :-

Extinguishing Medium	**Recommended for use on fires involving**
WATER	Wood, paper, textiles and similar materials
FOAM	Liquid fire like oil, paint, varnish, petrol
DRY CHEMICAL POWDER	Gas fires, electrical fire
CO2	Flammable liquids, electrical equipments
TERNARY EUTECTIC CHLORIDE (TEC)	Combustible metals
NOVEC 1230	Total Flooding
FM-200	Total Flooding
GELLEY WET CHEMICAL	Galley Fat fire
INERGEN GAS	Total Flooding

FIRE FIGHTING AGENTS

Substance which are used for extinguishing fires, are termed as Fire Extinguishing Agents. Substance which is used for extinguishing fires onboard and their effects / process.

Substances **Effects/process**

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Water	Cooling
Foam	Smothering/ cooling
Carbon Dioxide	Smothering/ cooling
Dry Chemical Powder	Inhibiting (BCR)/ smothering
Inergen gas	smothering
NOVEC 1230	Cooling (heat absorption)
Wet chemical	Smothering
FM- 200	Chemical chain reaction and heat removal

Factors to be considered in selecting an extinguishing medium for application in any situation are listed below:-

- Reactivity with the burning substances
- Efficiency in a particular situation (enclosed space/ open space)
- Electrical conductivity
- Possibilities of evolution of toxic vapors, effects on life supporting environment.
- Possibilities of undesirable physical phenomenon (boil over)
- Availabilities of appropriate appliances
- Effects on the stability of the vessel
- Possibilities of damage to cargo, equipments or other items

WATER

Water is a coolant having large capacity of absorbing heat far in excess of any other commonly used medium. As it extracts heat from the burning substance it turns into steam, which gives smothering effect. It may be applied in a solid jet on class A fires involving solid materials such as wood, paper and fabrics achieving deep penetration to the seat of fire. A fine spray can be used in extracting heat from the flames from the burning liquids without seriously disturbing the surface of the liquid. Water spray curtains are used to protect the front of the superstructures facing the cargo tanks from deck spillage fires. Water spray curtains generated at nozzles of hand held hoses are also effective for protection of the fire fighters. Water is also having some advantages and some disadvantages:-

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Advantage	Disadvantage
Cooling effect	It conducts electricity
Available	It can cause considerable damage to the cargo / machinery and electrical equipments
Smothering action of water after changing in steam.	It can cause loss of stability when used in large quantities
Cheap	It can cause corrosion It can cause boil over

CARBON DIOXIDE GAS

For smothering it is used to dilute the oxygen content of the atmosphere in the compartment from normal 21% to a level which is insufficient to support combustion. For most substances this is in the range of 11% to 16% but for smoldering solid combustible materials a further reduction may be necessary to achieve complete extinction.

Carbon Dioxide gas is also having some advantages and disadvantages.

ADVANTAGES

- It is non corrosive, non conductor of electricity, non toxic
- It is cleanest extinguishing medium, heavier than air
- It is not subject to deterioration in quality with age
- It is easily and most places available
- Penetrates in inaccessible area, does not thermally decompose

DISADVANTAGES

- It is highly asphyxiating; a concentration of about 9% would produce unconsciousness within few minutes. Impaired visibility.
- It has very little cooling effect and there is consequently a danger of re-ignition if air is readmitted to the compartment too soon after the fire.
- Less effective in open area, Noise during discharge
- When discharged, particles of solid Carbon Dioxide are normally present which can generate sufficient static charge to produce an incentive spark which could ignite in flammable atmosphere such as may be found in ships.

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For this reason CO_2 is unsuitable as an inerting medium in cargo oil tanks and pump rooms.

TYPES OF FOAM

1. CHEMICAL FOAM

Chemical foam is formed by mixing an alkali (usually sodium bi carbonate) with an acid (usually aluminum sulfate) in water. Both stored in separate container. When made to mix together it goes under chemical reaction to form foam. Produced Foam gets pressurized with CO_2 gas within to be released from extinguishing equipment. (These types of extinguishers / Chemical foam are no more in use onboard ship)

2. MECHANICAL FOAM

Mechanical foam is produced by mixing a foam concentrate with water to produce a foam solution. The bubbles are formed by turbulent mixing of air and the foam solution. It is produced by portable / mobile extinguishers, foam applicators, FB 5X, FB 10X and foam monitors etc.

EXPANSION RATIO

- Low Expansion (8 to 12:1)
- Med Expansion (12 to 150:1)
- High Expansion (150 to 1000:1)

Low expansion / Medium expansion foam is produced by portable / mobile extinguishers, foam applicators and foam monitors. It is used on open Deck , cargo tank tops . The foam can be thrown on a distance from monitors.

High expansion foam is produced by high expansion Foam Generators. Used only in enclosed spaces. Engine room, Cargo holds required steel trunking to pour the foam in the space. This foam is giving smothering effect. This foam cannot be thrown on a distance as it is very light in weight. One or two vents required to be in open condition.

TYPES OF DRY CHEMICAL POWDERS

1) Sodium Bicarbonate
2) Potassium Bicarbonate
3) Mono Ammonium Phosphate
4) T E C

Sr. No. 1 & 2 - Used on “B” and “C” Class Fires
Sr. No. 3 - This is multipurpose powder can be used on “A”, “B” and “C”

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Class Fires

Sr. No. 4 - It is heat resistant powder and can be used on "D" class fire only

MEDIUMS NOT TO BE USED ON METAL FIRES

- Water
- Foam
- Gases
- Bi-Carbonate

CAN BE USED ON METAL FIRES

- Dry Sand
- Powder Graphite
- Soda Ash
- Lime Stone
- TEC

T.E.C. (TERNARY EUTECTIC CHLORIDE)

It consist other heat resistant chlorides powders.

- Sodium Chloride 20%
- Potassium Chloride 29%
- Barium Chloride 51%

INERT GAS

A gas mixture of nitrogen, carbon dioxide and other gases such as flue gas containing very less oxygen to prevent combustion. It is produced by ships boiler or IGG. It is combination of following gases:-

- Carbon Dioxide - 12 to 14.5%
- Oxygen - 02 to 4.5%
- Sulphur Dioxide - 02 to 3%
- Nitrogen - About 79%

Remainder water vapor, solids and other gases.

INERTING

The introduction of inert gas in a space with the objective of reducing the oxygen content to a level at which combustion cannot be supported.

PURGING

The introduction of inert gas into a inerted space to reduce hydro carbon concentration below a % age which will not form a flammable mixture.

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TOPPING UP

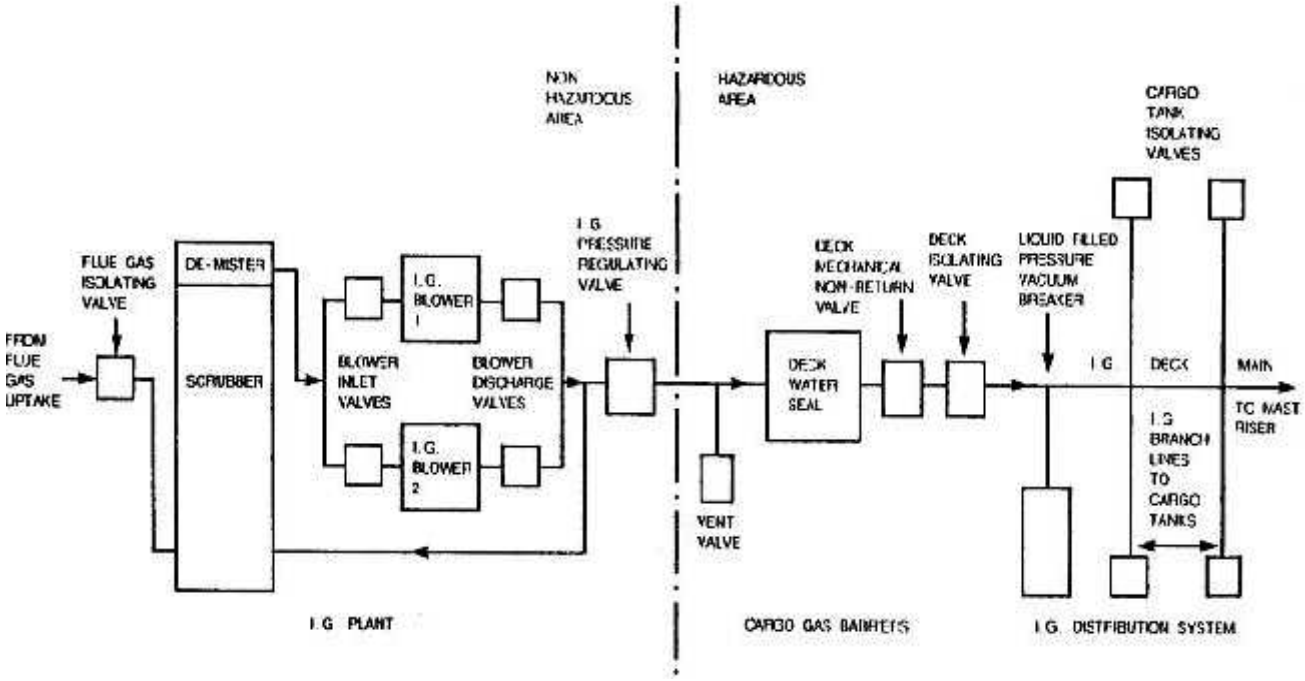
Topping up is the introduction of inert gas into a tank which is already in the inert condition with the object of raising the tank pressure to prevent any ingress of air.

GAS FREE

Is the introduction of fresh air into space to lower the level of any flammable, toxic or inert gases and raise the oxygen level as available in normal atmosphere.

EXPLOSION

The sudden release of high pressure gas into the environment. (A violent bursting as a result of internal pressure).



INERT GAS FLOW CHART

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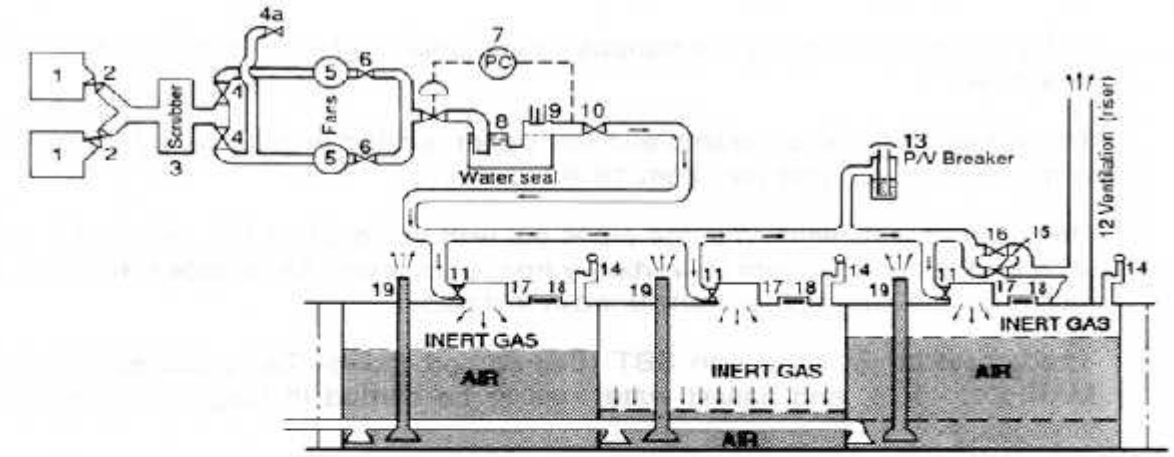

1	Boiler gas uptake or inert gas generator	6	Fan isolating valves, pressure side	13	Pressure/vacuum breaker (common)
2	Gas uptake valves	7	Pressure control valve	14	P/V valves (individual)
3	Scrubber	8	Deck water seal	15	P/V valve in ventilation line
4	Fan isolating valves, suction side	9	Nonreturn valve	16	Bypass valve
		10	Deck line isolating valve	17	Tank hatch
4a	Fresh air intake valve	11	Tank isolating valves	18	Level indicator
5	Fans	12	Ventilation mast (riser)	19	Purge pipe

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FIRE PREVENTION

STRUCTURAL FIRE PROTECTION

1. Division of the ship into main vertical zones by thermal and structural boundaries.
2. Inert gas protection on tankers.
3. Lockers for combustible materials.
4. Use of flame retarding materials.
5. Flame screens and other devices for preventing the passage of flame.
6. Protected stairways
7. Fire doors
8. Water tight doors
9. The use of steel.
10. Provisions with respect to the fire main, diameter, pressure.

Continuous monitoring of hydrocarbon % for pump room in tankers. Audio & visual alarm in pump room, CCR, ECR and at bridge at level not higher than 10% of LEL is must from 01/7/2005.

ACTIVE FIRE PROTECTION

Is an integral part of fire protection. Active fire protection is characterized by items and /or systems, which require a certain amount of motion and response in order to work, contrary to passive fire protection. With this the end result is fire extinguishment. ie sprinkling system, co_2 fixed flooding system, hyper mist system.

PASSIVE FIRE PROTECTION

Uses things that slow or contain fire, like fire doors, fire walls, divisions, bulkheads or fire retardant materials but do not put out the fire or take any type of action (limits the fire to a particular area only).

Primary measure within the ships structural construction to provide inherent fire safety and protection
Responds against flame, heat and smoke.
Maintains structural stability, fire separation.
Raises the fire resistance of the structure
Reduces fire spread through secondary ignition, limiting the movement of flame and smoke.
Protect personnel from the fire (heat and smoke) and
Make escape or evacuation possible
Protect systems and equipment of essential importance for safety

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Maintain structural integrity for the required period of time.

FIRE TEST PROCEDURE CODE

The previous 1998 edition is replaced with a comprehensively revised and updated 2010 edition, which will take effect at the start of July 2012. This code provides guide line for different types of materials which is being used for constructing the ship.

This code is intended for use by the administration and the competent authority of the flag state when approving products for installation in ships flying the flag of the flag state in accordance with the fire safety requirements of the international convention for the safety of life at sea, 1974, as amended.

NON – COMBUSTAIBLE MATERIAL

Are those materials which produce only a very limited amount of heat and flame when exposed to temperatures of approximately 750°c.

DIFFERENT CLASSES OF DIVISIONS

'A' CLASS DIVISIONS: Divisions formed by bulkheads and decks which comply with the following.

- Constructed of steel or other equivalent material
- Suitably stiffened
- Capable of preventing the passage of smoke and flame to the end of the one hour standard fire test

The average unexposed-face temperature rise as determined shall not be more than l40°C, and the temperature rise recorded by any of the individual unexposed-face thermocouples shall not be more than l80°C during the periods given below for each classification:

Class "A-60" 60 min, Class "A-30" 30 min, Class "A-15" 15 min, Class "A-0" 0 min.

'B' CLASS DIVISIONS:

Divisions formed by bulkheads, decks, ceilings or linings that:

i) Are so constructed as to be capable of preventing the passage of flame to the end of the first 30 minutes of the standard fire test;

ii) Have an insulation value such that during the standard fire test the average temperature of the unexposed side will not rise more than 140° centigrade above its initial temperature, nor will its temperature at any one point, including any

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joint, rise more than 225° centigrade above its initial temperature within the time listed below:

B-15 standard 15 minutes , B-0 standard 0 minutes

iii) Are constructed of suitable non-combustible materials also their supporting members

"F" CLASS DIVISIONS: (Relevant To Fast Speed Crafts)

Divisions formed by bulkheads, decks, ceilings or linings that:

i) Are so constructed as to be capable of preventing the passage of flame to the end of the first 30 minutes of the standard fire test

ii) Have an insulation value such that during the standard fire test the average temperature of the unexposed side will not rise more than 139° centigrade above its initial temperature, nor will the temperature at any one point, including any joint, rise more than 225° centigrade above the original temperature, up to the end of the first 30 minutes of the standard fire test.

"F" class divisions – New vessels must conform with the structural fire protection requirements laid down in the codes .Any reference to an **"F"** class division (which has the standard of a combustible "B-30" division) should be treated as equivalent to a "B-15" class division.

"C" CLASS DIVISION - Are divisions constructed of approved non combustible material. They need meet neither requirements relative to passage of flame and smoke nor limitations relative to the temperature rise. Combustible veneers are permitted provided they meet the requirements prescribed.

STANDARD FIRE TEST - Means a test in which specimens are exposed in a test furnace to temperatures corresponding approximately to the standard time-temperature curve. the specimen shall resemble as closely as possible the intended construction and include, where appropriate, at least one joint.

1. At the end of the first 5 min 576°c
2. At the end of the first 10 min 679°c
3. At the end of the first 15 min 738°c
4. At the end of the first 30 min 841°c
5. At the end of the first 60 min 945°c

FIRE TEST PROCEDURES CODE 2010 -

Part 1 Non-combustibility test
Part 2 Smoke and toxicity test

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Part 3 Test for "A", "B" and "F" class divisions
Part 4 Test for fire door control systems
Part 5 Test for surface flammability (Test for surface materials and primary deck Coverings)

Part 6 (blank)*
Part 7 Test for vertically supported textiles and films
Part 8 Test for upholstered furniture
Part 9 Test for bedding components
Part 10 Test for fire-restricting materials for high-speed craft
Part 11 Test for fire-resisting divisions of high-speed craft

SAFE WORKING PRACTICES (FIRE PRECAUTIONS)

The only sure way to avoid the disasters consequences of a fire at sea not to have one at all. It is moral responsibility of every one onboard to take all the necessary precautions to prevent a fire from occurring.

Although safe working practices have been listed below, it is basically a commonsense, and a sense of responsibility (attitude) that matters eventually. Good housekeeping is the prime requirement for prevention of fires.

1. SMOKING

Fires are often caused by careless disposal of burning cigarettes ends and matches, or smoking at prohibited places. Ashtrays and suitable containers must be provided and used where smoking is permitted. Care must taken to insure that matches are fully extinguished, and the cigarette ends are properly stubbed out. They must not be thrown out overboard since these may be blown on board.

Conspicuous warning notices should be displayed in all part of the ship where smoking is forbidden. Disciplinary action must be taken against the persons not obeying such instruction. it is dangerous to smoke in bed.

2. ELECTRICAL APPLIANCES AND OTHER FITTINGS

Unauthorized persons must not interfere with electrical fittings. Permission should be taken from the ship's electrical officer or the responsible engineer officer before using and connecting personal electrical appliances. Notices should be displayed on the notice boards and in accommodation spaces to this effect.

Applications and fittings must be tested and maintained as per Rules and Regulations for national and classification authorities. Precautionary measures must be adhered to before commencing during and after any of the electrical item or distribution system is being attended to for repair or

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maintenance.

Use of faulty appliance, machinery, fitting or wiring should be stopped immediately and brought to the attention of responsible officer. All electrical appliances must be firmly secured and served by permanent connections wherever possible. Make shift plugs, plugs sockets and fuses should not be used. Overloading of circuits must be avoided at all times to prevent damage to the fittings and insulation. All portable appliances, lights etc. must be isolated from the mains after use.

Fixed heaters and similar appliances must be fitted with appropriate guards and maintained in good order .Wrong Practice of drying clothes over the heaters must be
avoided. Use of portable heaters must be avoided at all times. However, only under special circumstances in ports, such appliances may be used with appropriate precautionary measures of preventing contact or proximity with combustible materials such as furniture, carpets, floors, etc.,

3. LAUNDRY SPACES

Hand pressing irons must be switched off after use, and secured on suitable stand. Clothing should be left to dry only in designated places. Drying of clothes in machinery spaces, or close to heating appliances, radiators etc. must be prohibited.
Contact of clothes with steam pipes, electrical appliances, etc. must be prevented at all times.

4. SPONTANIOUS COMBUSTION

Is a type of combustion which occurs by self heating (increase in temperature due to exothermic internal reactions)and finally leading to ignition without external ignition.

5. MACHINERY SPACES

Good housekeeping entails cleanliness, prevention of oil leaks, and proper storage of combustible materials, maintaining guards, and similar practices. Suitable metal containers should be provided for storage and disposal of cotton waste or rags. Such containers must be emptied at frequent intervals and content disposed off in safe manner.

Wood, paints, spirit, oils, greases and similar substances must be kept away from hot spaces like boiler rooms, generator platform, purifier spaces etc. Engine room bilges and tank tops should be kept clean and free of oil and rages. Proper lighting would help during inspection and will indicate leaks etc.

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Particular care must be taken in carrying out maintenance work on lubricating, hydraulic, and fuel oil equipment and system to avoid accidental release of oils under pressure. Possibility of oil drips on hot surfaces (exhaust trucking, steam pipes, heaters) must be eliminated through repositioning oil lines or providing appropriate guards as far as possible.

Welding and gas cutting work must be carried out with great care at all times. Similarly grinding and metal cutting works needs to be carried out with appropriate precautions against occurrence of fire. Particular care must be taken when filling a tank which has its sounding pipe in the machinery spaces, ensure that the weighted cock (self closing) working and the plug on the sounding pipe is closed all the time. Similarly, transfer of oils and bunkering operation where there is a possibility of overflow within the machinery spaces must be carried out with utmost care. Where portable lights are needed to provide adequate illumination, they should be clamped or otherwise secured in position (not hand-held) with leads kept clear of the working area and protected from chaffing.

6. HOT WORK

Welding and gas cutting elsewhere other than in the engine room workshop should generally be subject of a 'permit to work'. Only competent persons should be allowed to carry out welding and hot work. Equipment must be checked carefully before use. Welding and gas cutting must be properly supervised at all times. Suitable fire extinguishers must be kept nearby for any emergency.

Before commencing any kind of hot work, check must be made to ensure that there is no combustible material (solid, liquid or gas) at below or adjacent to area of work. Similarly, when working on bulkheads, ceilings and similar locations one must ensure that the other side is clear of combustible materials, cables, pipelines and other services which might be affected by heat.

Utmost care must be taken while working in tanks, pump rooms and enclosed spaces.

Suitable screens/ nets must be erected to prevent falling of hot metal in open tanks, hatches, etc.

7. GALLEYS

Fire in galleys and pantries occur due to spills of oil and fat on hot surfaces, or oil leaks from pipes and container. Electrical equipment with loose/faulty connections, switches, broken insulation and similar defects must not be used until the fault has been rectified.

Ovens, burners, hot plates should be shut off when cooking is finished.

Oil pans should never be left within ovens. Only recommended frying pans and appliances must be used. Fire blankets and extinguishers must be kept readily

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accessible at all times.

4. **GOOD HOUSE KEEPING** – on completion of work, materials must be returned to the safe places and work area must be made neat , clean and in ship shape.

DEEP- FAT COOKING EQUIPMENT

1. An automatic or manual extinguishing system tested to an international standard acceptable to the organization
2. A primary and backup thermostat with an alarm to alert the operator in the event of failure of either thermostat
3. Arrangements for automatically shutting off the electrical power upon activation of the extinguishing system
4. An alarm for indicating operation of the extinguishing system in the galley where the equipment is installed
5. Controls for manual operation of the extinguishing system which are clearly labeled for ready use by the crew.

PAINT LOCKERS

1. A carbon dioxide system, designed to give a minimum volume of free gas equal to 40% of the gross volume of the protected space
2. A dry powder system, designed for at least 0.5 kg powder/m^3
3. A water spraying or sprinkler system, designed for 5 l/m^2 min. water spraying systems may be connected to the fire main of the ship in any case, the system shall be operable from outside the protected space.

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FIRE DETECTION

FIXED FIRE DETECTION AND FIRE ALARM SYSTEMS

PURPOSE

The purpose of this regulation is to detect a fire in the space of origin and to provide for alarm for safe escape and fire fighting activity. For this purpose, the following functional requirements shall be met:

1. Fixed fire detection and fire alarm system installations shall be suitable for the nature of the space, fire growth potential and potential generation of smoke and gases;

2. Manually operated call points shall be placed effectively to ensure a readily accessible means of notification; and

3. Fire patrols shall provide an effective means of detecting and locating fires and alerting the navigation bridge and fire teams.

GENERAL REQUIREMENTS

Fixed fire detection and fire alarm system and a sample extraction smoke detection system required in this regulation and other regulations in this part shall be of an approved type and comply with the Fire Safety Systems Code.

- The fixed fire detection and fire alarm system with manually operated call points shall be capable of immediate operation at all times.
- There shall be not less than two sources of power supply for the electrical equipment used in operation of the detection and fire alarm system, one of which shall be emergency source. The supply shall be provided by separate feeders reserved solely for that purpose. Such feeders shall run to an automatic change over switch situated in.
- Detectors and manually operated call points shall be grouped into sections. The activation of any detector or manually operated call point shall initiate a visual and audible fire signals at the control panel and indicating units. If the signals have not received attention within 2 minutes an audible alarm shall be automatically sounded throughout the crew accommodation.
- The control panel shall be located on the navigation bridge or in the main fire control station.
- The fire detection system shall not be used for any other purpose except that closing of fire doors and similar functions may be permitted at the control panel.

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INSTALLATION REQUIREMENTS

Manually operated call points - Shall be installed throughout the accommodation spaces and control stations. One manually operated call point shall be located at each exit. Manually operated call points shall be readily accessible in the corridors of each deck such that no part of the corridor is more than 20 mtrs from the manually operated call point (as per SOLAS).

In passenger ships, an indicating unit that is capable of individually identifying each
detector that has been activated or manually operated call point that has operated shall be
located on the navigation bridge.

In cargo ships, an indicating unit shall be located on the navigation bridge if the control panel is located in the fire control station. In cargo ships and on passenger cabin balconies, indicating units shall, as a minimum, denote the section in which a detector has activated or manually operated call point has operated.

INTRODUCTION

An automatic fire alarm and detection system is required to be installed in the machinery, accommodation and cargo spaces of different class of vessel as per the stipulated regulations. Automatic fire detectors operate on various principles –

1. Detectors shall be operated by heat, smoke or other products of combustion, flame, or
any combination of these factors. Detectors operated by other factors indicative of incipient fires may be considered by the Administration provided that they are no less sensitive than such detectors. Flame detectors shall only be used in addition to smoke or heat detectors.
2. Smoke detectors required in all stairways, corridors and escape routes within accommodation spaces shall be certified to operate before the smoke density exceeds 12.5% obscuration per meter, but not until the smoke density exceeds 2% obscuration per meter. Smoke detectors to be installed in other spaces shall operate within sensitivity limits to the satisfaction of the Administration having regard to the avoidance of detector insensitivity or oversensitivity.
3. Heat detectors shall be certified to operate before the temperature exceeds 78°C but not
until the temperature exceeds 54°C, when the temperature is raised to those limits at a rate less than 1°C per minute. At higher rates of temperature rise, the heat detector shall operate within temperature limits to the satisfaction of the

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Administration having regard to the avoidance of detector insensitivity or oversensitivity.
4. The operation temperature of heat detectors in drying rooms and similar spaces of a
normal high ambient temperature may be up to 130°C, and up to 140°C in saunas.
5. All detectors shall be of a type such that they can be tested for correct operation and
restored to normal surveillance without the renewal of any component.

DETECTORS

Human being can realize a fire through senses like eyes, skin, nose and ears.

- Our eyes enable us to see flames and smokes.
- Our body makes us feel the heat.
- Smell tells us the presence of combustion ashes.
- Ears - sound

Our senses in fact, act as a complete fire detection system and a very efficient one too. However, it is now possible for us to adopt a equipment (fire detectors) which can carry out such functions in absence of a human senses and thus provide a vigilance at all times.

FIRE DETECTORS

- Smoke (Combustion product) Type – (Smells a fire)
- Radiation (Flame) Type – (Sights a flame)
- Heat Type (Feels a fire)

TYPE OF DETECTORS

SMOKE

- Ionization Smell
- Optical Scatter See
  Obscuration See

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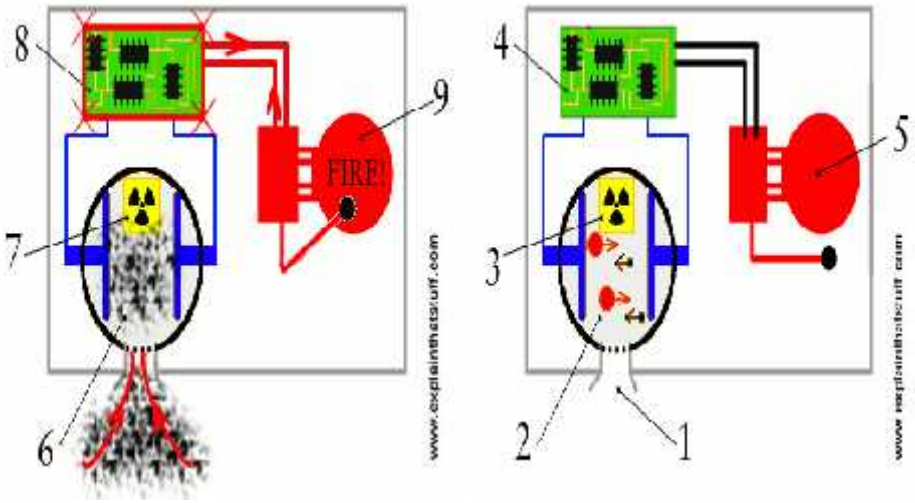

SPACE SUBJECTED TO AUTOMATIC FIRE DETECTION

Engine room , Navigation bridge , Cargo hold access , Main deck , Forecastle deck
Stores ,Poop deck / stores, Accommodation.
Detectors fitted detect the fire situation and sound an automatic alarm audio & visual.

HEAT

- Constant Temp. Feel
- Rate of Rise Feel

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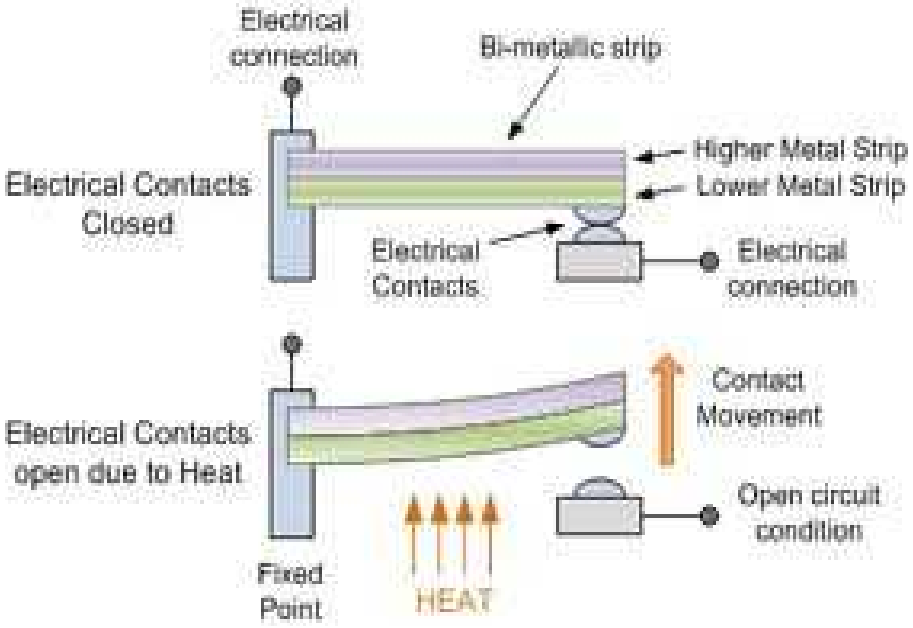

FLAME

- Infra Red See
- Ultra Violet See

PRINCIPLES OF DETECTION

Smoke – Consists of a suspension of solid or liquid particles in a gaseous medium .

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Ionization Detector – Sensitive to even small and invisible particles produced in the early stages of fire.

Optical Detector – Sensitive only to large and visible particles which give smoke its characteristic appearance.

SPACING OF DETECTORS -

Type of detector	Maximum floor area per detector	Maximum distance apart between centers	Maximum distance away from bulkheads
Heat	37 m2	9 m	4.5 m
Smoke	74 m2	11 m	5.5 m

FIRE DETECTION CONTROL UNIT-

A red light indicates fire or smoke.
A blue light indicates trouble in system.
A white light indicates that the power is on.
Read makers manual for your ship detection system.

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FIXED FIRE EXTINGUISHING SYSTEMS

A FIXED FIRE EXTINGUISHING SYSTEM MAY BE ANY OF THE FOLLOWING SYSTEMS:

1. A fixed gas fire-extinguishing system complying with the provisions of the Fire Safety
   Systems Code;
2. A fixed high-expansion foam fire-extinguishing system complying with the provisions of
   the Fire Safety Systems Code; and
3. A fixed pressure water-spraying fire-extinguishing system complying with the provisions
   of the Fire Safety Systems Code.

FIRE FIGHTING APPLIANCES
GENERAL REQUIREMENTS FOR A FIXED SYSTEM

- The medium used should not produce toxic gases.
- The quantity of the medium must be adequate for the spaces, which are to be protected.
- The piping system must have control valves and hydraulically tested.
- The release of a gas medium must not be automatic.
- The order to release the medium must be given by the captain or a senior officer.

MISCELLANEOUS FIRE FIGHTING EQUIPMENTS ONBOARD

- Sand box
- Fire blankets
- Fire hoses, nozzles, main and fire hydrants
- Portable / mobile fire extinguishers
- Fire Pumps
- Emergency Fire Pump
- Fixed installation system
- International shore connection
- Automatic Fire Alarm and Fire detection system (Smoke, Heat and Flame Detectors)

SAND BOX

It is kept near the boiler on boiler platform .it is a basic medium for fighting minor

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fires. It is also useful for metal fires. A shovel is to be provided inside box. Sand boxes may be substituted by approved portable fire extinguishers.

Minimum volume = 0.1 m^3

FIRE BLANKET-

This blanket is a woven fiber glass fabric and comes in a satin weaved i.e. smooth, soft and tightly weaved which protects against skin irritation. This fabric is only 0.45mm thickness and can easily be wrapped around uneven surfaces, it provides an effective outer layer protection against unwanted contact with heat.

The blanket comes in sizes of 1.2m x 1.2m , 1.2m 1.8m, 1.8m x 1.8m. Fire Blankets comes in compact P.V.C. bag or container for ease of handling.

Since 1 July 2002, the installation of materials that contain asbestos has, under SOLAS
regulation II-1/3-5, been prohibited for all ships, except for some vanes, joints and insulation.
From 1 January 2011, any installation of materials that contain asbestos will, under SOLAS
Regulation II-1/3-5, be prohibited, for all ships without exceptions.

A fire blanket should be provided in every galley; provided that where the deck area of any galley exceeds $45m^2$, two such blankets should be provided.

EMERGENCY FIRE PUMP

- The capacity of the pump shall not be less than 40% of the total capacity of the fire

Pumps required by regulation of the Convention and in any case not less than the following:

a) For passenger ships less than 1,000 gross tonnage and for cargo ships of 2,000 gross tonnage and upwards - 25 m3/h
b) For cargo ships less than 2,000 gross tonnage - 15 m3/h.

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- Any diesel driven power source for the pump shall be capable of starting with hand cranking at 0° C. Service fuel tank capacity for at least 3 hrs. on full load and reserve fuel for additional 15 hrs. Hand cranking, or approved type of alternative means for starting at least 6 times in 30 minutes, and at least twice in the first 10 minutes.
- The emergency fire pump shall as a minimum comply with requirement of
  FSS Code.
- Where a fixed water-based fire extinguishing system installed for the protection of the machinery space in accordance with SOLAS regulation , is supplied by the emergency fire pump, the emergency fire pump capacity should be adequate to supply the fixed fire extinguishing system at the required pressure plus two jets of water.
- The capacity of the two jets shall in any case be calculated by that emanating from the biggest nozzle size available onboard but shall not be less than 25 m3/h.

FIXED FIRE EXTINGUSHING SYSTEM -

1.	Carbon dioxide	For engine room, pump room, cargo holds and paint store, galley
2.	Foam (High Expansion)	For Machinery Spaces and cargo holds
3.	Sprinkler Systems	For accommodations, engine room, cargo holds and paint stores (for accommodation / working spaces automatic water spray system) (For engine room, cargo holds and paint stores high pressure water spray system)
4.	Foam (Low expansion)	For open area (deck) and cargo tanks (tankers)
5.	Dry Chemical Powder	For Gas Carrier (LPG and LNG Tankers)
6.	Hyper mist system	For machinery space fire
7.	NOVEC 1230	Replacement to HALON
8.	Galley wet chemical fire extinguishing system	For galley fat fire

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9. FM – 200 fire extinguishing system Total flooding system
10. Inergen gas fire extinguishing system Total flooding system

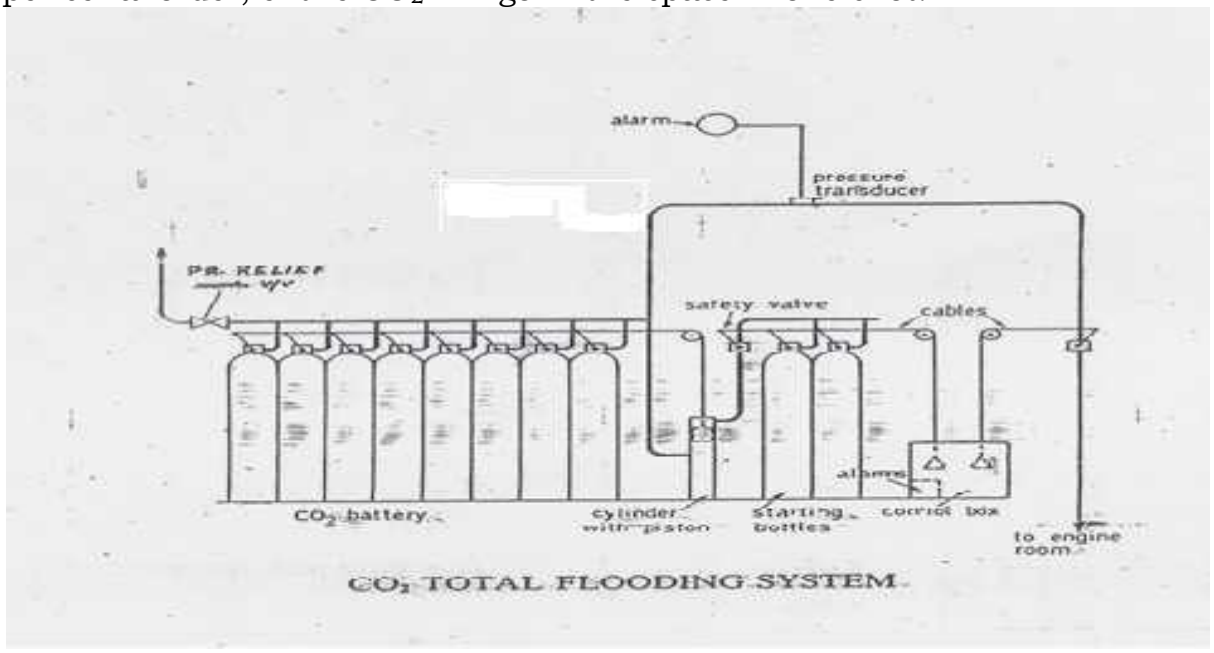
SMOTHERING EFFECT BY CARBON DIOXIDE

CO_2 is very cleanest extinguishing media which having some advantages. It is non-corrosive, does not conduct electricity, leaves no residue, and dilutes O_2 to lower percentage. It does not deteriorate with age and always available, cheaper.

CO_2 is having some disadvantages also. It is highly asphyxiating and slightly toxic, concentration of 9% would produce unconsciousness within few minutes, cannot be used in open spaces (no effect). It has little cooling effect and there is consequently danger or re-ignition if air is readmitted to the compartment too soon after the fire. When discharged particles of solid carbon dioxide are normally present and can generate sufficient static charge to produce an incentive spark which could ignite inflammable atmosphere such as may be found on ships.

For this reason Carbon dioxide is unsuitable as an inerting medium in cargo oil tanks . Before flooding CO_2 in engine room / space make sure nobody is in the compartment. Close all vents, stop running machinery, eject entire CO_2 in one lot by gang release arrangement.

There are two levers to release co_2 medium as per the instruction as per serial order, entire CO_2 will go in the space in one shot.



CO_2 TOTAL FLOODING SYSTEM

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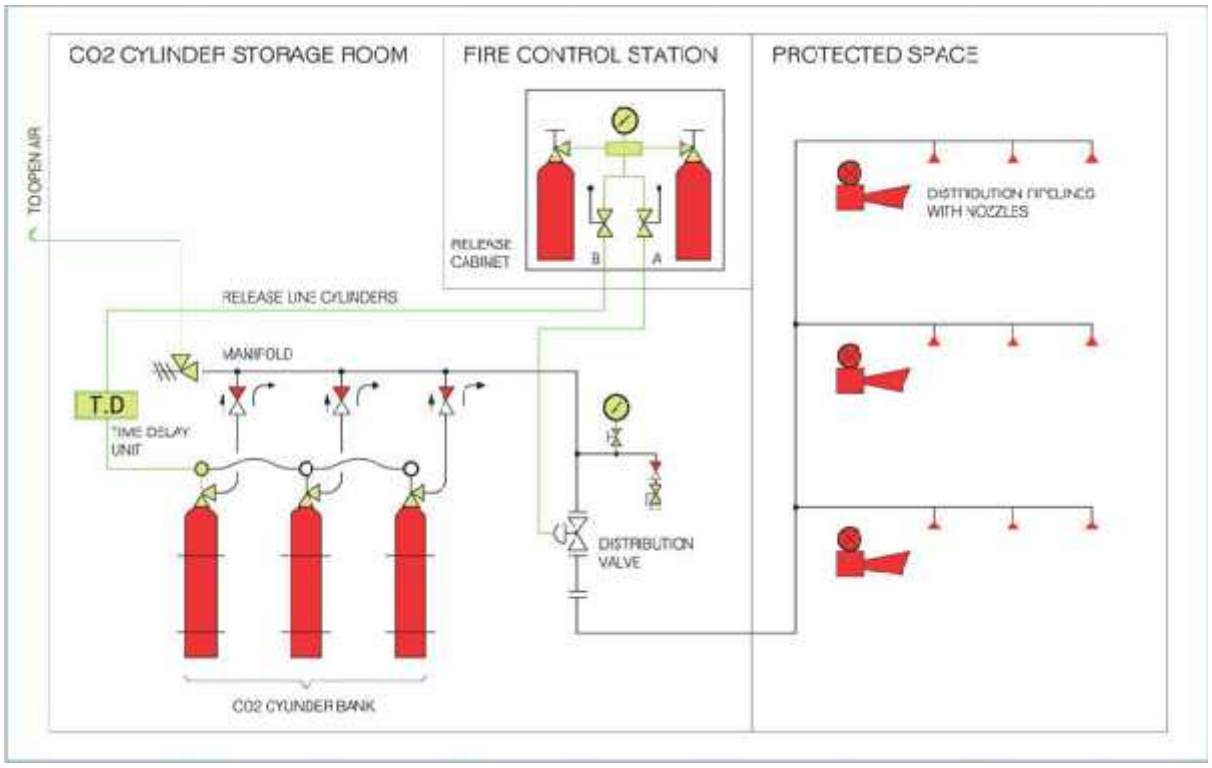

A carbon dioxide system complying with the provisions the Fire Safety Systems Code and with the following:
1. The alarms giving audible warning of the release of fire-extinguishing medium shall be safe for use in a flammable
cargo vapour/air mixture; and
2. A notice shall be exhibited at the controls stating that due to the electrostatic ignition hazard, the system is to be
used only for fire extinguishing and not for inerting purposes.

SMOTHERING EFFECTS OF FOAMS/ TYPES OF FOAM CONCENTRATES

HIGH-EXPANSION FOAM FIRE-EXTINGUISHING SYSTEMS - Shall be approved by the Administration based on the guideline developed by the Organization.

Any required fixed high-expansion foam system in machinery spaces shall be capable of rapidly discharging through fixed discharge outlets a quantity of foam sufficient to fill the
greatest space to be protected at a rate of at least 1 m in depth per minute.

The quantity of foam-forming liquid available shall be sufficient to produce a

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volume of foam equal to five times the volume of the largest space to be protected. The expansion ratio of the foam shall not exceed 1,000 to 1.

There are two types of foams chemical foam and mechanical foam. Chemical foam is phased out by administration and mechanical foam is being used. It is very Good extinguishing media. This foam is also having some percentage of water. Same is changed into steam, because of fire having temperature. Steam is having smothering effect to dilute O_2 below required level for flame.

NOTE - Steam as a fire-extinguishing medium is not permitted. Where the use of steam is permitted by the Administration, it shall be used only in restricted areas as an addition to the required fire-extinguishing system and shall comply with the requirements of the Fire Safety System Code.

HIGH EXPANSION FOAM
ADVANTAGES

- Can spread all around the space and provide lasting cover(smothering)
- Can be rapidly started and used.
- Can be fixed to existing ventilation ducts.
- Persons can walk through the foam before being asphyxiated.
- Unit can be used for extracting smoke.
- Very less maintenance is required.

DISADVANTAGES

- Cannot be thrown at distance.
- Not suitable for use in open spaces or space under slight pressure.
- Large steel trunking is required

FIXED DECK FOAM SYSTEM- RULES

For ships carrying chemicals or oils in bulk, SOLAS/IMO require a fixed deck foam system for extinguishing fires on deck or in tanks.

FIXED LOW-EXPANSION FOAM FIRE-EXTINGUISHING SYSTEMS

1. The foam concentrates of low-expansion foam fire-extinguishing systems shall be approved by the Administration based on the guidelines developed by the Organization.

1. The system shall be capable of discharging through fixed discharge outlets in not more than 5 min a quantity of foam sufficient to cover to a depth of 150 mm the largest single area over which oil fuel is liable to spread. The expansion ratio of the foam shall not exceed

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12 to 1.

2. Means shall be provided for the effective distribution of the foam through a permanent system of piping and control valves or cocks to suitable discharge outlets, and for the foam to be effectively directed by fixed sprayers on other main fire hazards in the protected space. The means for effective distribution of the foam shall be proven acceptable to the administration through calculation or by testing.
3. The means of control of any such systems shall be readily accessible and simple to

Operate and shall be grouped together in as few locations as possible at positions

not likely to be cut off by a fire in the protected space.

4. Provisions of isolating valves to isolate damaged sections of the system.
5. For satisfactory operation of the proportionator, foam liquid must be supplied with a minimum pressure of at least 10 meters head higher than the inlet water pressure under all load conditions.

Supply of foam solution shall be not less than the greatest of the following:

1 0. 6 *l*/min per square meter of cargo tanks deck area, where cargo tanks deck area

Means the maximum breadth of the ship multiplied by the total longitudinal extent

of the cargo tank spaces;

2 6 *l*/min per square meter of the horizontal sectional area of the single tank having

the largest such area; or

3 3 *l*/min per square meter of the area protected by the largest monitor, such area

being entirely forward of the monitor, but not less than 1,250 *l*/min.

4 Sufficient foam concentrate shall be supplied to ensure at least 20 min of foam

generation in tankers fitted with an inert gas installation or 30 min of foam generation in tankers not fitted with an inert gas installation

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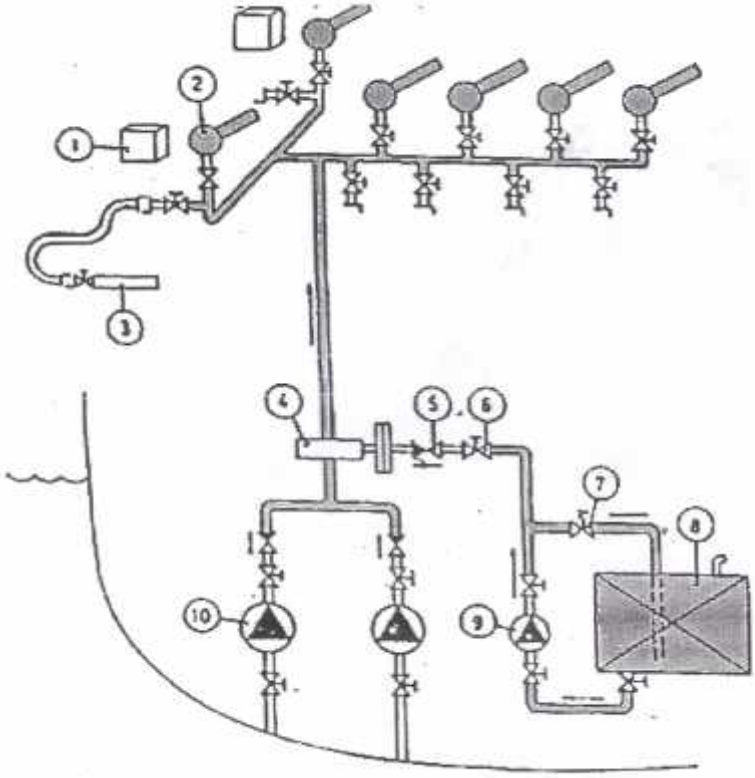
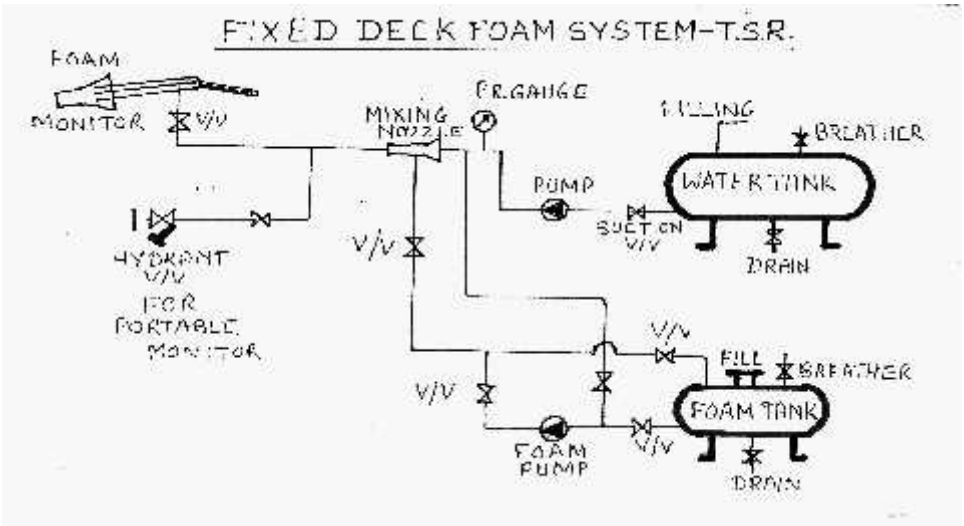


Diagram of Fixed Deck Foam System

1. Foam Hydrant
2. Foam / Water Monitor
3. Foam Branch pipe
4. Balanced Pressure Proportioner (SDA/MP)
5. Check Valve
6. Manual Shut off Valve
7. Re-circulation Valve
8. Foam Liquid Tank
9. Foam Liquid Pump
10. Water Pump



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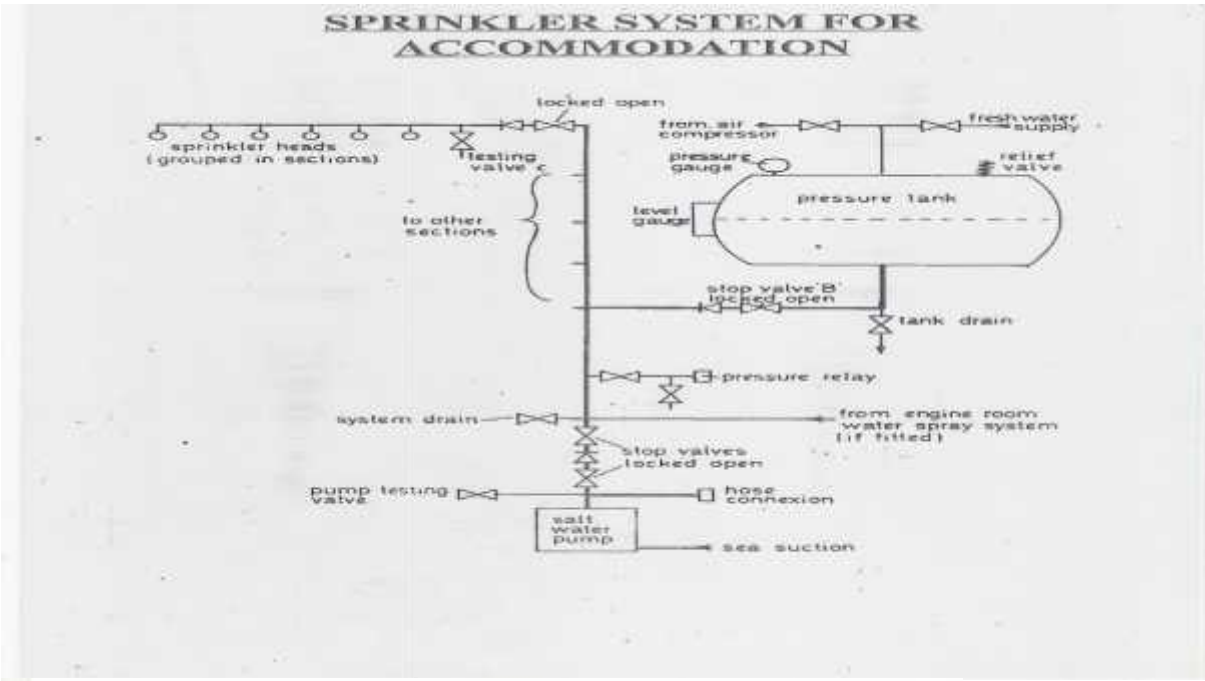
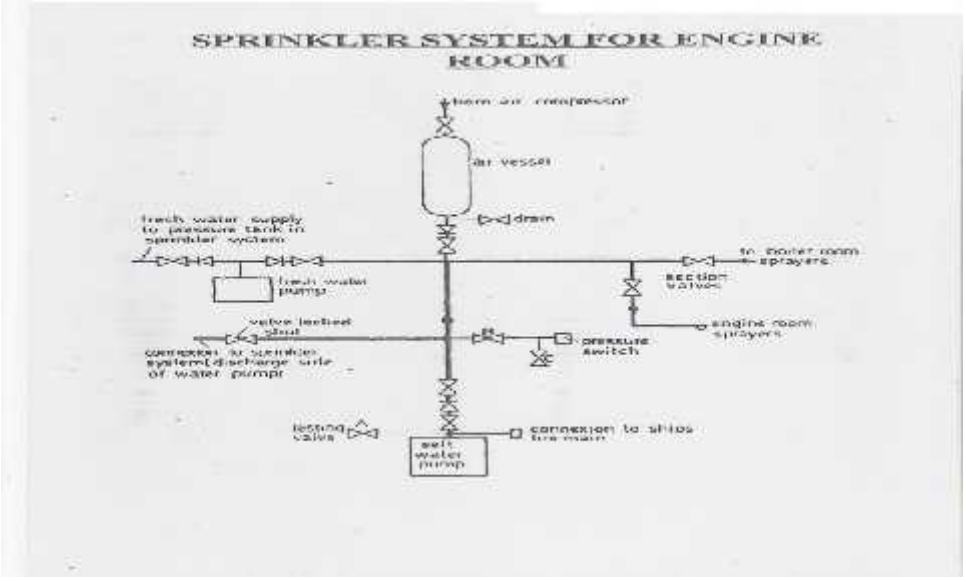
OPERATION - Check water level in water tank, foam concentrate in foam tank. Open suction valves for both pump for water and foam. open relevant valves in foam monitor line. First start the water pump, let water come out from monitor, start foam pump and see foam discharges from monitor.

SPRINKLING SYSTEM FOR ACCOMODATION -





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SPRINKLER SYSTEMS REQUIREMENTS-

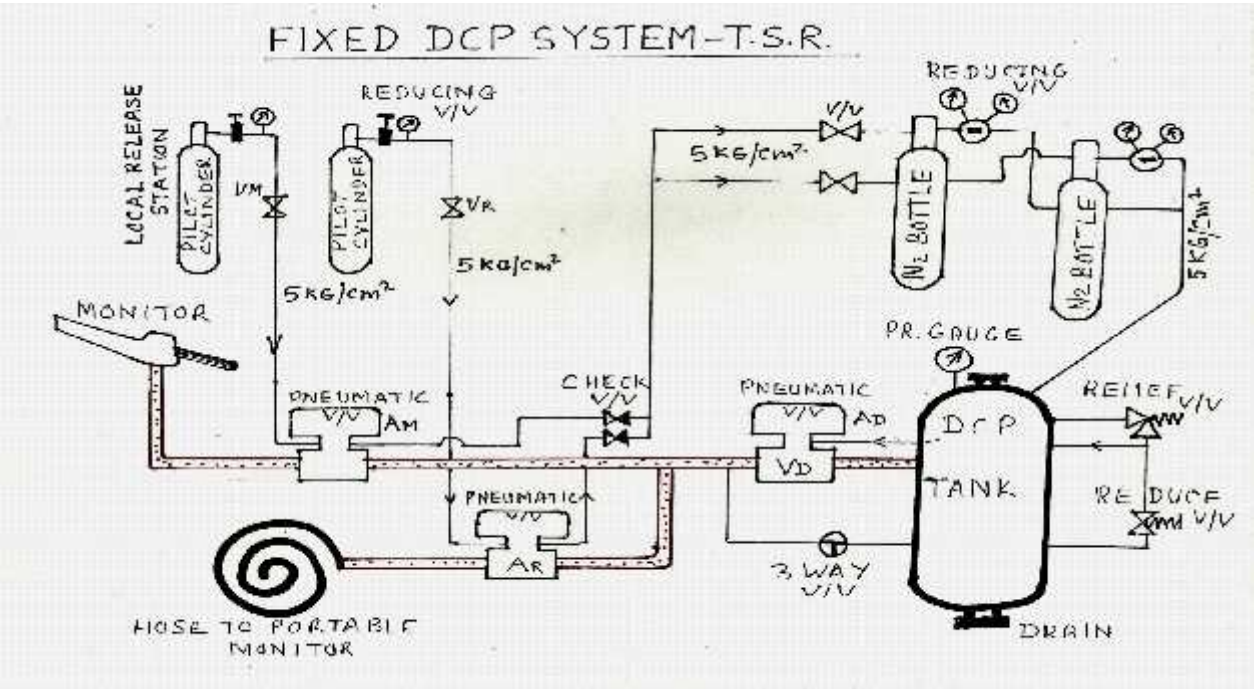
Shall be of the wet pipe type, but small exposed sections may be of the dry pipe type where in the opinion of the Administration this is a necessary precaution. Saunas shall be fitted with a dry pipe system, with sprinkler heads having an operating
Temperature up to 140 degree Celsius.

There shall be not less than two sources of power supply for the sea water pump and automatic alarm and detection system.

The sprinklers shall be resistant to corrosion by marine atmosphere. In accommodation
and service spaces the sprinklers shall come into operation within the temperature range from 68^0C to 79^0C, except that in locations such as drying rooms, where high ambient Temperatures might be expected, the operating temperature may be increased by not more than 30^0C above the maximum deck head temperature.

Sprinklers shall be grouped into separate sections, each of which shall contain not more than 200 sprinklers. In passenger ships any section of sprinklers shall not serve more than two decks and shall not be situated in more than one main vertical zone.

FIXED DCP SYSTEM –



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HYPER MIST SYSTEM New IMO requirements

1. Ships constructed on and after July 1, 2002 to be installed.
2. Installed in machinery spaces accommodating machinery with a particularly high risk like incinerator room, boiler room, diesel generator room, main engine room, purifier room, inert gas generator room, power pack room.

As per SOLAS regulation ii-2/7.7 for category a machinery spaces fixed water-based local application fire-fighting systems should be provided for local fire suppression in areas, without the necessity of engine shut-down, personnel evacuation, shutting down of forced ventilation fans or the sealing of the space.

Fresh water mist advantages

1. Mist is safe for crews & friendly with the environment.
2. No damage to equipment while in operation ,such as diesel engines, generators and electrical control panels located in protected areas.
3. It absorbs radiant heat from the fire
5. Creates a shield, reduces the temperature of the fire area by evaporating upon contact with the flame
6. Depletes the oxygen, thereby extinguishing or suppressing the fire.
7. Very small quantity of water used, the damage by water is small.
8. Evaporation of fine mist deprives heat in a large quantity thus high fire extinguishing effect.
9. Gasoline fire can be extinguished quickly.
10. Spray fire can be extinguished quickly.
11. The fog hanging around the flame shuts off heat radiations and prevents fire extension.
12. The atmosphere is cooled and the fire extension is prevented with, no re-ignition
13. Minimal residues

Starting

1. System start select switch can be on auto manual or manual position.
2. Incase of fire in any protected space. Press system start switch for relevant space.
3. Ensure hp pump running and hyper mist release indication is on the panel.

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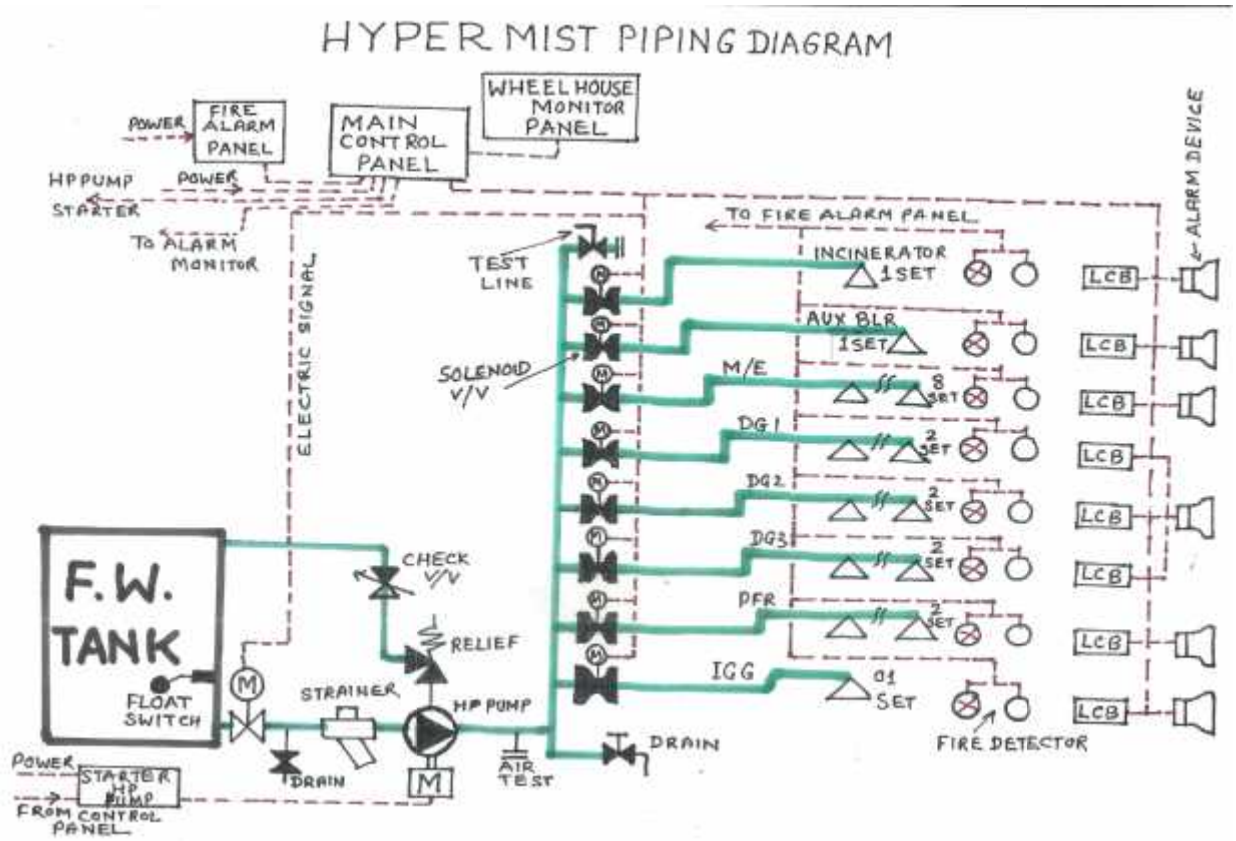
Auto starting

1. System start select switch to be put on auto manual.
2. As the system is connected to local fire alarm control panel, hyper mist is automatically released with audio visual alarm.
3. Ensure hp pump running and hyper mist release indication is on the panel.



HALON 1301 BTM REPLACEMENT- Fire-extinguishing systems using Halon 1211, 1301, and 2402 and fluorocarbons shall be prohibited.

FM 200 Heptafluoropropane as a replacement for Halon 1301 in applications requiring a clean, environmentally acceptable fire extinguishing agent, suitable for use in manned areas.

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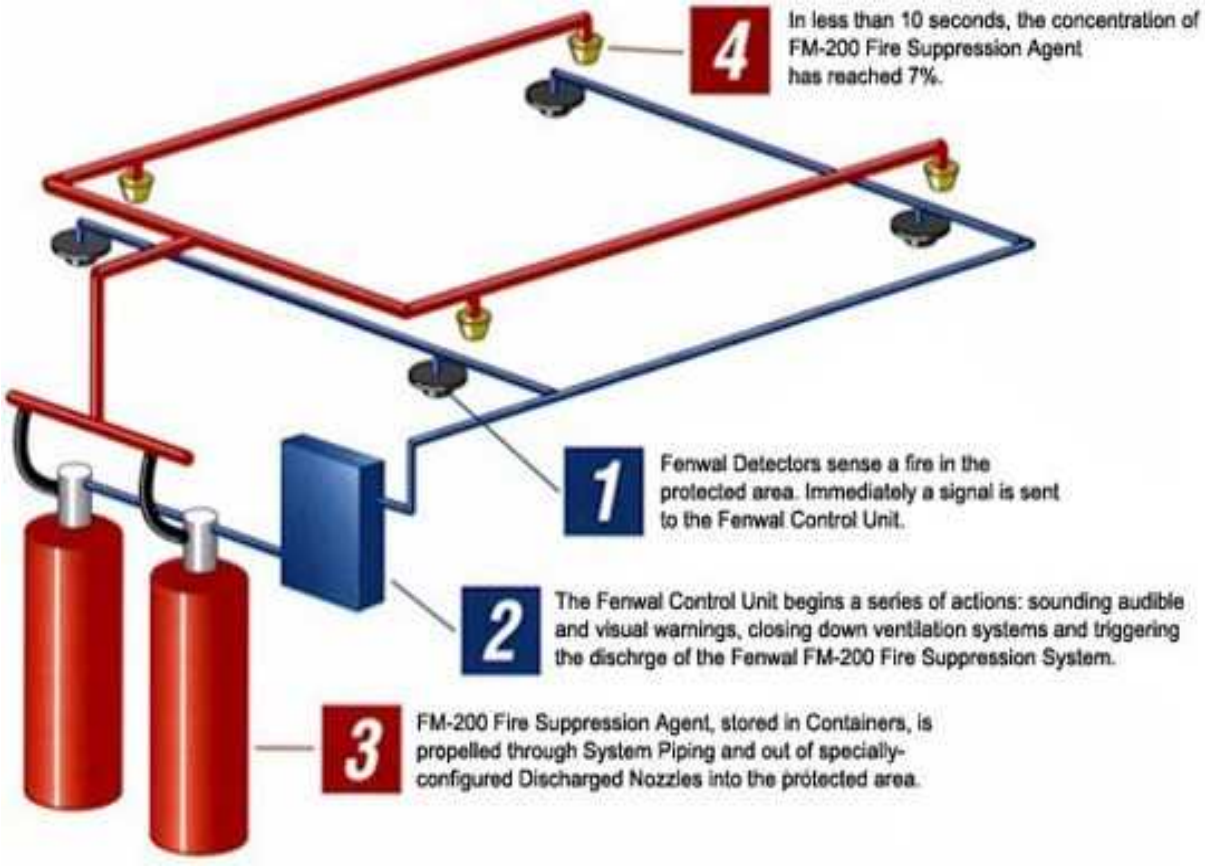

FE-13 Is the preferred Halon replacement in total flooding and inerting applications where its low toxicity provides for improved safety margins. Is the safest for protecting areas where people are present.

NOVEC 1230 - $C_6F_{12}O$ - IS A PRODUCT OF 3M.

Used in situations where use of water is impractical. NOVEC 1230 is ideal for use in total flooding applications, localized flooding systems and may be used in portable extinguishers also. Used in places like engine room, electronic equipment room, LV- HV cargo switch board, cargo compressor room, oil grease room, computer rooms. Extinguish fires involving flammable liquids, gases and electrical equipment.

Is a product of Minnesota Mining and Manufacturing Company.

(dodecafluoro-2-methylpentan-3-one)

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PROPERTIES -

1. Zero ozone depletion potential
2. 2. 5-day atmospheric lifetime
3. Global warming potential of 1
4. Greatest margin of safety for use in occupied spaces.
5. Boiling point 42.5^0c
   5. Non reactive, non flammable, non corrosive

NOVEC1230 -

1. NOVEC 1230 fluid is a high molecular weight

2. Has a heat of vaporization of 88.1 kj/kg

(25 times less than that of water, causes NOVEC 1230 fluid to evaporate more than 50 times faster than water)

3. Has low vapor pressure.

4. Liquid at room temperature

5. Gasifies immediately after being discharged in a total flooding system.

6. Extinguishes fire by heat absorption and not by O2 reduction.

Approved by a number of marine agencies around the world and has been fully tested in accordance with the international maritime organization MSC/circ.848 on revised guidelines for the approval of fixed gas fire extinguishing systems, as referred to in SOLAS 74 for machinery spaces and cargo pump-rooms.

NOVEC 1230 is stored in cylinder in form of a liquid and nitrogen super-pressurize in container to 25 to 35 bar at 20°c. when the system is activated the contents flow into the distribution pipe work to the discharge nozzle(s) where it is rapidly dispersed as a vapor (a minimum discharge time of 5 seconds maximum not more than 10 seconds).

During the discharge the space will be fogged which may reduce visibility. this normally clears rapidly and should not obstruct the ability of personnel to safely exit the protected area.

There can be two release cabinet one beside protected space another in fire control station. the cabinet door to remain in open position unless area has been certified safe for entry

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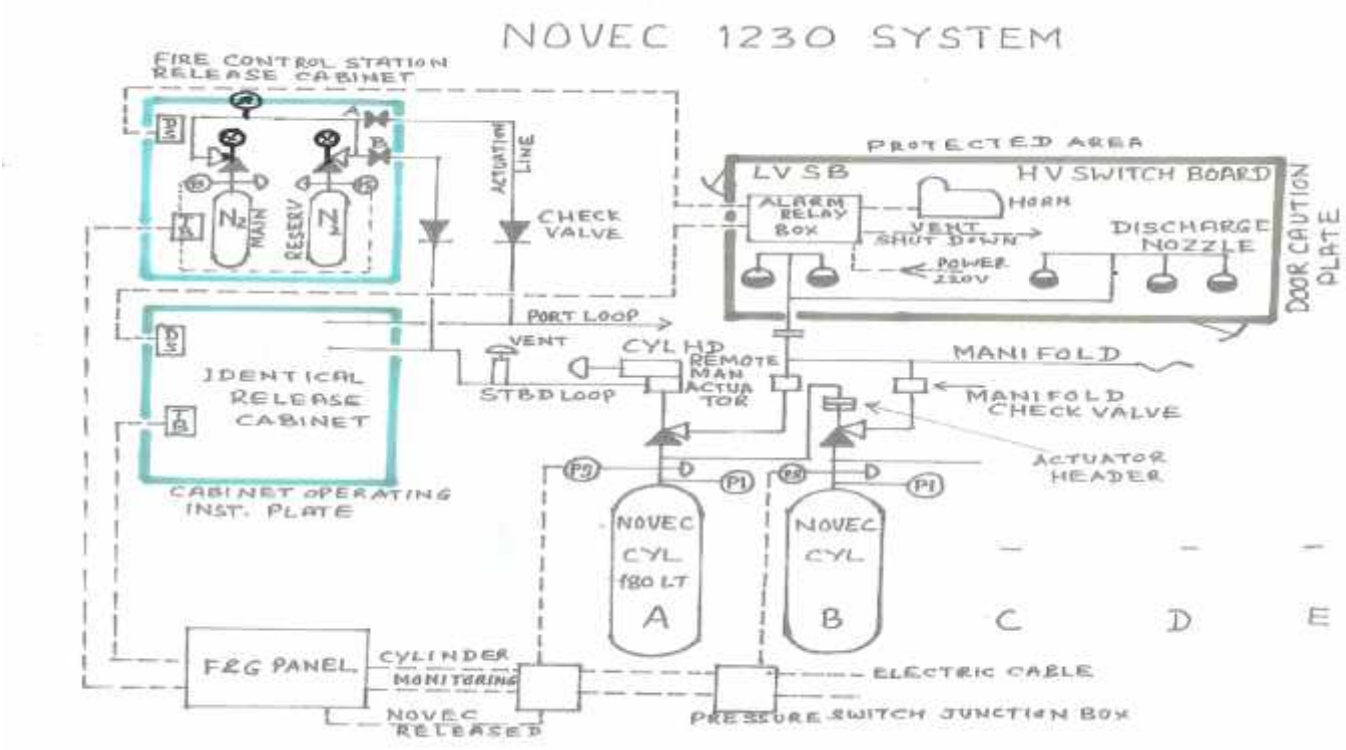
A. NOVEC 1230 is a colorless and low odor fluid
B. Density around 11 times that of air.
C. It decomposes at temperatures in excess of 500°c 4.upon exposure to the flame as mentioned above, NOVEC 1230 will decompose to form halogen acids. their presence will be readily detected by a sharp, pungent odor before maximum hazardous exposure levels are reached.
D. Decomposition products from the fire itself especially carbon monoxide, smoke, oxygen depletion and heat may create a greater hazard.
E. The performance of a gaseous total flooding system is largely dependent on the integrity of the protected enclosure.
F. The required retention time will depend on the particulars of the hazard, but MSC/circ.848 states that this should **not be less than 15 minutes**.
G. Longer retention times may sometimes be necessary if enclosures contain hazards that may readily become deep seated.



TO OPERATE

1. Open actuation release cabinet door. This will activate the alarm and shut down ventilation fans.

2. Ensure all personnel cleared off the affected area space fully sealed.

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3. Open main actuating cylinder hand wheel to fully open. if no reading on pressure gauge , unscrew the reserve cylinder hand wheel to full open.

4. Open actuating control valve A NOVEC 1230 released.

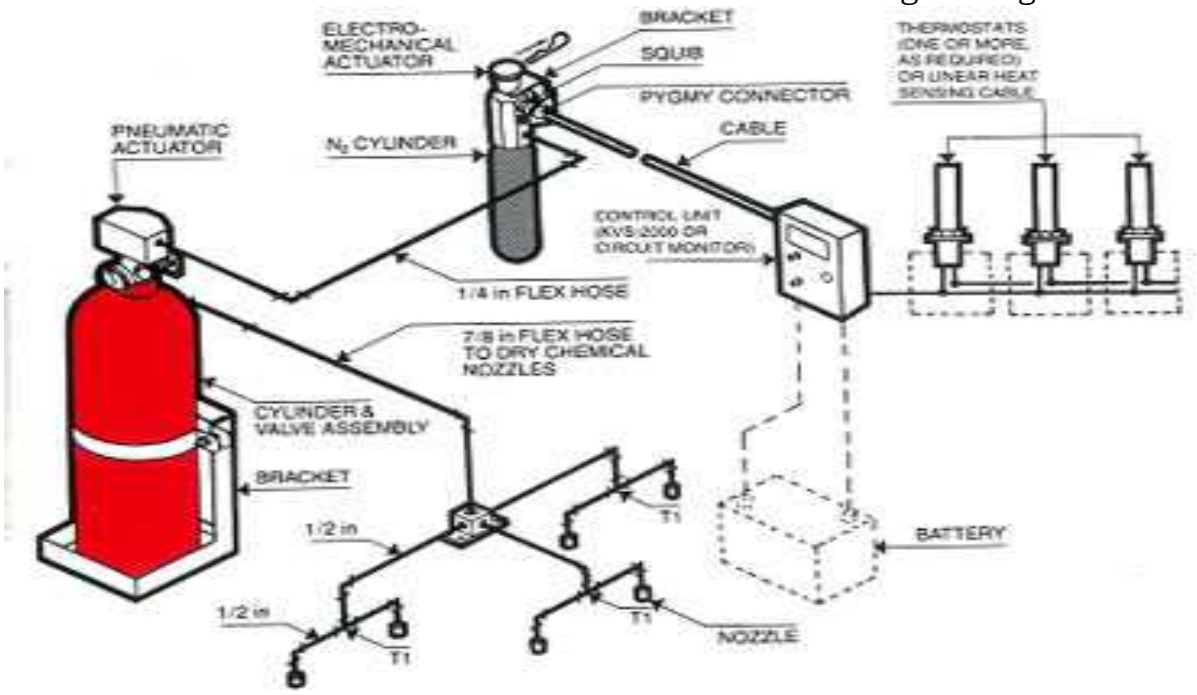
5. If NOVEC cylinder fails to operate open control valve B.

NOVEC to be discharge in a minimum time of 5 seconds maximum not more than 10 seconds.

Thoroughly mixing in protected volume in a concentration of 4.2% but not exceeding 10% in normally occupied spaces.

Cylinder pressurized by N_2 to a pressure of 25 bars, has dip tube up to bottom.

INERGEN GAS is an environmentally green three dimensional fire suppression agent replacing Halon 1301. Critical facilities such as data processing rooms, telecommunications switching facilities, process control rooms, and others, require a non-water based extinguishing agent



- Is electrically nonconductive
- Is safe for use in human occupied facilities
- Would not damage sensitive electronic equipment
- Has zero ozone depletion, zero global warming, and zero atmospheric lifetime

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Inergen is a blend of three naturally occurring gases—Nitrogen 52%, Argon 40%, and Carbon Dioxide 08% . It is stored in cylinders near the facility under protection. An Inergen system lowers the oxygen content of the protected area to a point sufficient to sustain human life, but insufficient to support combustion. It's that simple. Because it's not a chemical agent, Inergen will not produce a heavy fog the way other extinguishing agents do, so escape routes remain visible.

GALLEY WET CHEMICAL FIRE EXINGUISHING SYSTEM -

According to the SOLAS regulations, ships must install a marine fire extinguishing system to protect the galley, in particular the fryer employed in the cook line. The galley wet chemical system offers 24-hour automatic or manual protection and detection for cooking areas, ducts, hoods and cooking surfaces. the wet chemical suppressant liquid has been specially formulated to suppress fires in cooking oils and grease and prevent re-ignition.

System can operate automatic and manual both. Heat detectors or fusible links of lead (melting point 600^0 F , flash point of most cooking oils) can be used to detect fire conditions for alarm purpose and auto activation. on receiving the appropriate fire signal the system control panel sounds audible and visual alarms and immediately initiates shut down of the power supply to the appliance being protected. Simultaneously the control system deploys the suppressant liquid onto the fire. wet chemical suppressant forms a thick, soapy barrier between the fuels surface and the atmosphere and extinguishes fire .the wet chemical extinguishing agent is a potassium carbonate based solution / aqueous potassium bicarbonate, potassium acetate, potassium citrate. discharged as fine droplets into a protected area. the main extinguishing action is by cooling caused by the heat of vaporization. The fine spray discharge prevents the dangerous splash of hot grease or thermal shock damage to cooking appliances.

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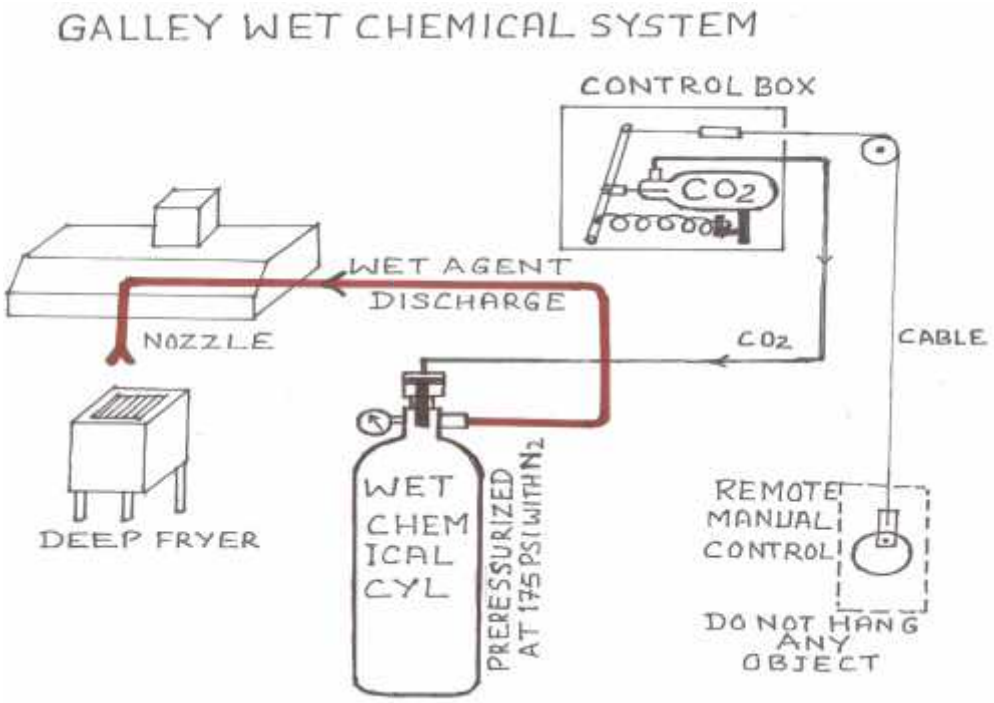

Re-ignition is prevented by saponification, a process in which the wet chemical agent combines with the grease to form a soapy layer at the surface of grease to seal off the fuel from the oxygen, allowing the grease to cool to below it's auto-ignition temperature. the system operates at a nominal pressure of 12 bar (175 PSI) providing a fine spray discharge lasting for about 45 seconds.wet chemical agent unlike dry powder may be quickly cleaned up following a discharge resulting in shorter down time of the cooking range.

IN CASE OF FIRE - with reference to figure above (maker- kidde – KRS 50 control)

1. Pull the pin out and then pull the ring hard on the remote manual control
2. This will puncture the co_2 pilot bottle which in turn will open the wet chemical cylinder via
   a system valve actuator
3. The wet chemical will be propelled through nozzles over the appliances to be protected

For automatic operation when the fusible link detector operates, the release of tension in the fusible link cable allows the control head to actuate. a spring-loaded plunger depresses the check stem in the cylinder valve, discharging the contents of the cylinder. the control head also releases tension in a cable to an

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optional tandem control head or gas shut off valve, causing operation of these devices. the control head is equipped with a local manual release handle.

WET CHEMICAL IN CYLINDER

Is potassium alkaline base solution which has been pressurized by dry nitrogen gas under 175 psi / 12 bar. After discharge the wet chemical in cylinder to be recharged as soon possible

EXTINGUISHING PROCESS

- Saponification of surface grease (turning it into combustion-resistant soap).
- The cooling effects of water vaporization.
- The inerting effects of resultant steam formation.
- The interruption of the chemical chain reaction of combustion.

If galley does not have wet chemical fire suppression system, there should a wet chemical fire extinguisher in the galley. the extinguisher has the same extinguishing agent as the wet chemical fire suppression system. the extinguisher should be at safe distance away, but still within sight of the fryer. if there is no wet chemical extinguisher, there should be a fire blanket in the galley. fire blankets are effective in suppressing a grease fire, but a wet chemical extinguisher is the better option

Cylinder has a pressure gauge to measure pressure. A fusible plug fitted on bottle which will melt at about 100^0c to release the content view over pressurization.

GALLEY EXHAUST DUCT FIRE - May be fitted with a fixed cylinder of co_2 placed in a cabinet outside the galley. In event of fire when cabinet door opened to release Co_2, it will give an audio visual alarm, may shut the vent fan, and may have arrangement of shutting flaps to the duct. It depends upon the maker.

INTERNATIONAL SHORE CONNECTION

- To enable water to be supplied from another ship or from shore to the fire main.
- Every ship shall have at least one and stored together with a gasket, four bolts and eight washers. Gasket of any material suitable for 1 N/mm^2 services.
- Fixed provisions to be made to enable such a connection to be used on both sides of the ship.
- Shall have a flat flange on one side, and to the other have a permanently attached coupling that will fit the ship's hydrant and hoses. It designed for 1 N/mm2 services (10 bars)

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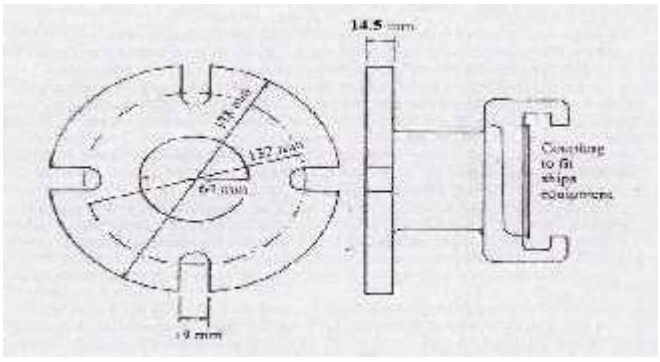
STANDARD DIMENSIONS -

- Outside Diameter – 178 mm, Inside Diameter 64 mm
- Bolt Circle Diameter – 132 mm, Flange Thickness – 14.5 mm (min)
- Bolts and Nuts – 4 each 16 mm. diameter, 50 mm in length
- Slots in flange 4 holes, 19 mm diameter

International shore connections are portable universal couplings that permit connection of shipboard fire main systems between one ship and another or between a shore facility and a ship when their respective system threading is mis-matched.



Ships of 500 gross tonnage and upwards shall be provided with at least one international shore connection to be used on either side of the ship.

EMERGENCY GENERATOR

Emergency generator set shall be powered by a suitable prime mover with its own independent fuel supply an independent cooling system. The set shall start automatically if the main power supply fails and to be on load not later than 45 seconds after failure of the main power supply.

Feeds power supply transforming equipment, Emergency switchboard, Emergency lighting switchboard and Transitional source of emergency power , emergency fire pump driven by motor, emergency air compressor, shall be located above the uppermost continuous deck and be readily accessible from open deck. It shall not be located forward of the collision bulkhead. Emergency generator on ship provides power in case the main generators of the ship fails and creates a "dead or blackout condition". According to general requirement, at least two modes of starting an emergency generator should be available. The two modes should be – battery start and hydraulic or pneumatic start. The Port state control (PSC) might detain a ship or provide some time to correct any kind of deficiency found if the second mode of starting is not operating. The testing of ship's emergency generator is done every week (as part of weekly checks) by running it unloaded to check if it starts on battery mode. The hydraulic start is done every month to ensure that it is

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working fine. Also every month automatic start of generator is also done to check its automatic operation and to see whether it comes on load.

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MISCELLANEOUS FIRE FIGHTING EQUIPMENTS

FIRE HOSE

Fire hose is one of the basic elements of a fire fighter's equipment, it is necessary to convey water from either open water supplies or pressure supplies e.g. hydrants to a fire area. In areas where water is in short supply, hoses may be required to relay water long distances and special large diameter hose is carried on certain "special" appliances for this purpose.

Hose is made of with non perishable synthetic yarns, especially polyester and nylon which have extra strength, and made of closely woven flax, canvas or other approved material. Provided with the couplings and other fittings and with dual purpose nozzles.

Fire hoses shall be of non-perishable material approved by the Administration and shall be sufficient in length to project a jet of water to any of the spaces in which they may be required to be used. Each hose shall be provided with a nozzle and the necessary couplings. Hoses specified in this chapter as "fire hoses" shall, together with any necessary fittings and tools, be kept ready for use in conspicuous positions near the water service hydrants or connections. Additionally, in interior locations in passenger ships carrying more than 36 passengers, fire hoses shall be connected to the hydrants at all times. Fire hoses shall have a length of at least 10 m, but not more than:

1. 15 mtr in machinery spaces;

2. 20 mtr in other spaces and open decks; and

3. 25 mtr for open decks on ships with a maximum breadth in excess of 30 mtr.

4. Unless one hose and nozzle is provided for each hydrant in the ship, there shall be complete interchangeability of hose couplings and nozzles.

NUMBER AND DIAMETER OF FIRE HOSES

1. Ships shall be provided with fire hoses, the number and diameter of which shall be to the satisfaction of the Administration.

2. In passenger ships, there shall be at least one fire hose for each of the hydrants required and these hoses shall be used only for the purposes of extinguishing fires or testing the fire-extinguishing apparatus at fire drills and surveys.

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3. In cargo ships of 1,000 gross tonnage and upwards, the number of fire hoses to be provided shall be one for each 30 mtr length of the ship and one spare, but in no case less than five in all. This number does not include any hoses required in any engine-room or boiler room. The Administration may increase the number of hoses required so as to ensure that hoses in sufficient number are available and accessible at all times, having regard to the type of ship and the nature of trade in which the ship is employed. Ships carrying dangerous goods shall be provided with three hoses and nozzles, in addition to those required above;

4. Cargo ship of less than 1,000 gross tonnage, the number of fire hoses to be provided shall be calculated each 30 mtr length one. One spare. However, the number of hoses shall in no case be less than three.

Hoses of unlined canvas should have a diameter of not less than 64 mm. Lined hoses of at least 45 mm internal diameter having a throughput comparable to that of 64 mm internal diameter unlined canvas at corresponding pressure may be used.

ROLLING AND STOWING HOSE

There are still 4 basic ways of making up hose namely :

- Common roll
- Dutch roll
- Flaking
- Figure of eight

COMMON ROLL / GENERAL ROLL

In this method the hose is laid out flat on the surface and a start is made at the female coupling. The coupling is doubled down on the hose which is then rolled up until the male coupling is reached. A shoes strap is finally passed through the centre of the roll and secured behind the male coupling. The correct method to run out a roll is to grasp the lugs of the female coupling with both hands and the hose then rotates as it is run out. Rolled hose should always be stowed on edge as shown in fig.

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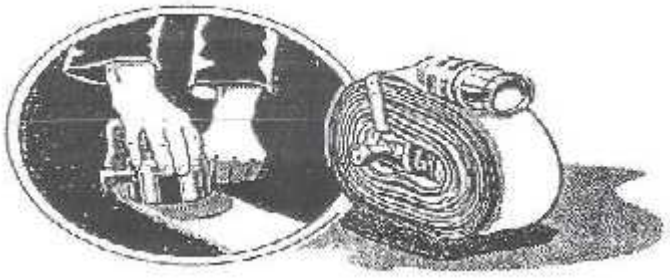
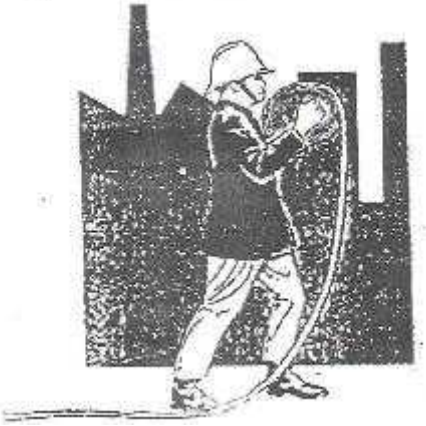


The method of starting to roll a length of hose with instantaneous couplings, the roll of hose completed and secured with a hose strap.



Correct method of holding a roll of hose with instantaneous couplings for running out.

DUTCH ROLL

The hose should be laid out flat on the surface and the female coupling should be drawn back along the hose towards the other end so that the female coupling lies on top of the hose and about 0.5 mtr short of the male coupling. After the upper layer has been arranged exactly over the lower layer the hose is rolled up from the bight so that the couplings come together on the outside of the roll.

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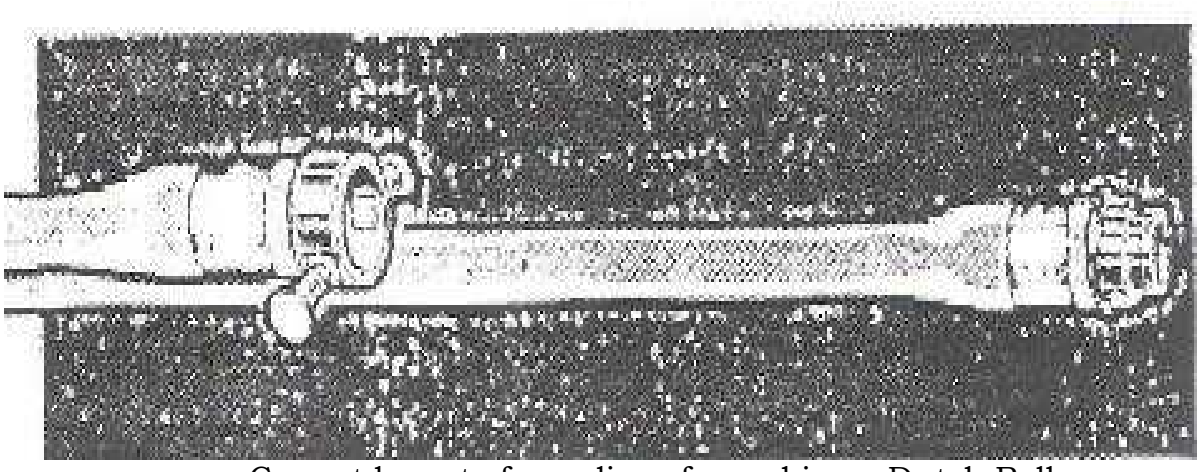
To run out hose made up in this manner, both couplings are held and the roll is given a push when it will roll out and uncoil itself leaving a long loop of hose. The male coupling can then be attached to the pump or stand pipe and the female coupling taken towards the fire.



Correct layout of couplings for making a Dutch Roll

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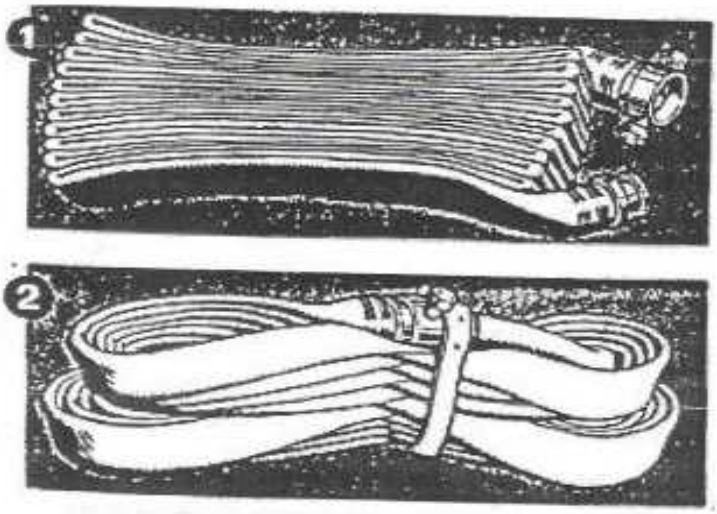
FLAKING

In this method the hose is doubled back and forward on itself and is subsequently secured at the centre of the folds.



Sketch showing (1) flaked hose and (2) hose made up on a figure of eight.
This is a variation of flaking avoiding the sharp bends. It can be used to store hose but takes up more room than when flaked.

DAMAGE AND REPAIR

The main causes of damage to modern hose are :

- Contact with sharp edges which do not always penetrate right through but may cut the outer cover.
- Damage by burning e.g. Laid over, or buried, by hot debris.

Repair to hose will depend on where the damage is, its extent, the age of the hose and the cost effectiveness of the repair e.g. time taken in man hours .

Small cuts can be sewn and patched and longer, deeper cuts can be internally patched and then sewn and patched, if necessary, on the outer cover.

Because of the type of hose now used by brigades very little, if any, repair is carried out on stations. Repair is a specialist job and is done in the brigade workshops.

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MILDEW

Mildew found on modern hose is caused by dirt and dampness on the surface and can be wiped off easily without affecting the hose cover. The spores will usually develop on hose lying wet for an extended period of time . Crews should be careful not to distribute the spores when removing the hose and as stated before, washing or wiping with a damp cloth will be enough to get rid of it.

CARE AND REPAIR OF HOSE

CARE

Despite the advances in the construction of hose and the subsequent elimination of a number of the old causes of damage, firefighters should still take the trouble to Avoid any maneuvers or procedures which could leave hose open to damage. Although modern hose resists abrasion, chemicals, mildew and shock, lack of care in these areas could cause damage and hose could fail at just the time that a firefighter needs the water most.

A few minor rules for firefighters to bear in mind are:

- Hose should always be ramped when laid across
- Hose should not be kinked round a corner under pressure
- Hose must be under-run before stowing on an appliance or wiped dry after cleaning, to avoid dampness in the appliance locker.
- Should not be dragged on sharp edge

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FIREMAIN

- Fire main lines are back bone of fire fighting system onboard ship.
- The number and position of fire hydrants shall be such that at least two jet of water not emanating from same hydrant one of which shall be from a single length of hose may reach any part of ship.
- In machinery space at least two hydrants one Port and one STBD side shall be provided.

FOR SAFETY OF FIRE MAIN

- Relief Valve – Is fitted to release extra pressure.
- Drain Valve – Prevent chocking, icing, freezing in cold climate
- Isolating Valve – Isolate from Engine Room to rest part of ship

TYPES OF NOZZLES

- Control Nozzles (DUAL PURPOSE)– Fireman will be able to control water as per requirement (jet, fine spray, water curtain and stop water). Ships are to have this type of nozzles only.

TYPES OF PORTABLE FIRE EXTINGUISHERS

Portable extinguishers approved under the MED should comply with the minimum capacities required by the Fire Safety Systems (FSS) Code:

- Gas Pressurized water type (9 liters)
- Gas Pressurized Foam (9 ltrs) (Mechanical Foam)
- Carbon dioxide (5kgs/6.8 Kgs)
- Dry Chemical Powder (5 kgs /10 Kgs)
- Wet chemical fire extinguisher galley cooking oil fire

MARKING ON EXTINGUISHERS

Each extinguisher should be clearly marked with the following minimum information

- ✓ Name of the manufacturer
- ✓ Types of fire for which the extinguisher is suitable
- ✓ Type and quality of extinguishing medium
- ✓ Approval details
- ✓ Instructions for use and recharge
- ✓ Year of manufacture
- ✓ Temperature range over which the extinguisher will operate satisfactorily
- ✓ Test procedures

PORTABLE EXTINGUISHERS

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On SOLAS ships built before 1 January 2009 and non SOLAS ships the minimum number of extinguishers is laid down by the regulations.

Portable fire extinguishers provided should have, so far as practicable, a uniform method of operation, and operating instructions should be in the working language of the ship. If the language is not English, a translation into English shall be included.

All extinguishers capable of extinguishing Class A and B fires carry a Fire Rating. The letter indicates the classification of fire. Some extinguishers, such as dry powder, carry both Class A and Class B rating because of the properties of the extinguishing medium.

23 kg in weight (as per IMO) in fully charged condition, all portable extinguisher are signal red painted.

In galleys which are fitted with oil-fired or electric cooking appliances foam, CO2, FM-200; Novec 1230; FE- 13; FE-36 or dry powder are acceptable for Class B risks. Where gas-fired appliances are fitted dry powder is recommended. A fire blanket is recommended for oil pan fires by the Code of Safe Working Practices and should be provided in every galley.

Spare charges shall be provided for 100% of the first ten extinguishers and 50% of the remaining fire extinguishers capable of being recharged on board. Not more than sixty total spare charges are required.

Instructions for recharging shall be carried out on board. For fire extinguishers which cannot be recharged on board, additional portable fire extinguishers of the same quantity. CO_2 extinguishers if loss of gas by weight exceeds 10 per cent of the original charge, as stamped on the bottle or cartridge must be send for filling.

Dry powder extinguishers may suffer from compaction when subject to vibration. It is recommended that at least one should be discharged annually and the retention of contents checked. Where the retention is found to be in excess of 15 per cent of the initial charge, further extinguishers should be discharged.

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PORTABLE EXTINGUISHERS

WATER TYPE FIRE EXTINGUISHER

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1. Water most commonly used extinguishing agents
2. Used on class “a” fires
3. Filled by water up to the mark
4. Pressurized with co_2
5. Extinguishes fire by cooling remove the "heat" element of the fire triangle.

FOAM EXTINGUISHER (AFFF)

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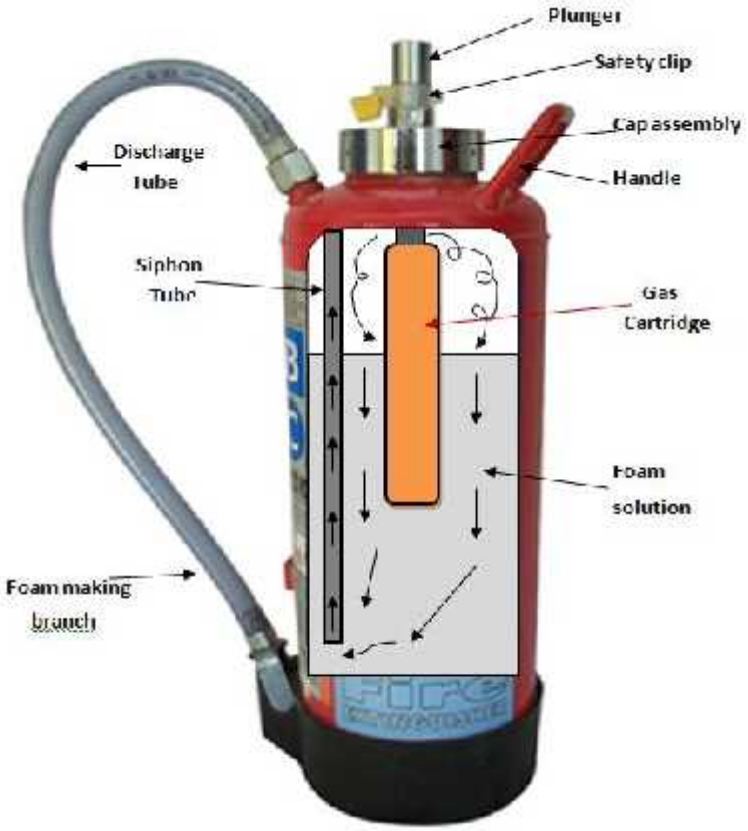

9 LITRE AFFF foam fire extinguishers are ideal for anywhere for flammable liquids fires. The 'film-forming' properties of AFFF will quickly seal the surface of a liquid fire to prevent re-ignition, Suitable for-, fuel storage area, paint storage area and any other premises with flammable liquids

Types of fire include Class A (wood, paper, cloth, etc), B (flammable liquids) but DO NOT use near live electrical equipment.

- Height 600 mm
- Cylinder diameter 189 mm (Overall width 300 mm)
- Filled weight 14.21 kg
- Discharge time 40 seconds
- Operating temperature 0 to 60°C

RANGE: Minimum 6 mtr for at least 30 to 40 sec. Hydraulically tested to 24 bars initially, subsequent tests as per manufacturers recommendations.

SNIFTER VALVE (BREATHER DEVICE)

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A **snifter valve** shall be fitted on the siphon tube or cap of the extinguisher. The design of the snifter valve shall be such that when the variation in atmospheric temperature is within ±10°C, there shall not be any spouting of liquid through the foam making nozzle.

CARBON DIOXIDE

Carbon dioxide in liquid state at ambient temperature is stored in heavy duty steel cylinder at a high pressure. The means of operating fall into two classes

(a) Piercing a disc and
(b) Opening of a valve.

Discharge from the piercing disc type, once initiated, cannot be stopped while that from the valve type can be done at will. In a valve type there is a risk of a partially empty extinguisher being returned to its stand and becoming a hazard to the next operator. In either case, the liquid is discharged through a short flexible or swivel hose to a discharge horn, where the liquid changes to gas and is

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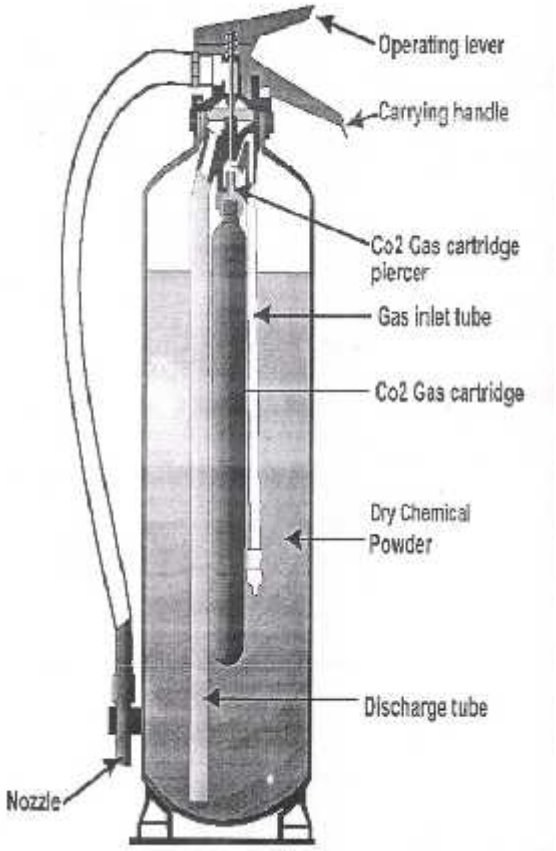
spread evenly over the burning surface, thus diluting the air. An internal pipe is fitted to ensure rapid release of liquid so that evaporation will not take place in the bottle, as this would cause icing due to absorption of latent heat of the liquid causing the formation of solid CO_2.

Hydraulically tested to 207 bars to 236 bars.

DRY POWDER (5 KG)



Cartridge-operated DCP Extinguisher- Co2 Stored-pressure DCP fire extinguisher- NITROGEN

DRY POWDER is expelled by means of pressure when CO_2 gas is released by piercing the gas cartridge. The internal gas tube is arranged to give a violent motion inside the container to induce the power into the discharge hose, which usually has a controllable nozzle.

There are DCP extinguisher which has the stored pressure of N2 for discharge,

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having a pressure gauge fitted.

Duration – With open nozzle 10 to 15 sec for 05 kg, 15 to 23 sec for 10 kg,

EXTINGUISHING EFFECT OF DCP

Cooling, smothering, shielding of radiant heat, chain breaking.

CHARGE Sodium bicarbonate, or potassium bicarbonate, or ammonium phosphate. Magnesium stearate is added to avoid compacting / caking of powder.

Hydraulically tested to 24 bar, subsequent tests as per regulations, as per manufacturer's recommendation.

GALLEY WET CHEMICAL FIRE EXTINGUISHER –

1. Marked by an oatmeal colored band
2. Effective cooking oils and fats fires - class "f" fire
3. Contain potassium acetate based solution
4. Smothering effect on fire
5. Has squeeze grip operation

To operate -

1. Pull out safety pin firmly (this will be held in by an anti-tamper seal).

2. Apply the wet chemical using the extended applicator in slow circular movements, which gives a gentle, yet a highly effective application in a fine spray form to the burning fat until the burning cooking oil changes into a soapy like substance. this then prevents re-ignition. nitrogen filled inside to 100 psi

Extinguishing process -

1. Firstly the mist cools the fire and lowers the temperature to stop the fire spreading, also prevents splashing of the hot oils/fat.

2. Secondly the potassium salts react with the hot oil and causes the process of saponification, coating the surface of the cooking oil or fat in soapy foam that is non combustible and acts as a barrier between the fat and oil.

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PERIODICAL INSPECTION AND MAINTENANCE ON EXTIGUISHERS-

Instructions supplied by the manufacturer for charging, inspecting and testing of extinguishers are to be adhered to.

The period between such inspection and maintenance should not exceed the period between safety equipment surveys.

Record of inspection should be maintained. The record should show the date of inspection, the type of maintenance carried out, and whether or not a pressure test was performed.

THEORY OF BREATHING APPARATUS (SCABA)
(SELF CONTRAINED COMPRESSED AIR BREATHING APPARATUS)

PURPOSE - To supply fresh air to the wearer on demand
NECESSITY - To save life of men and materials
FUNCTIONS

- Provide sufficient positive pressure fresh air to the wearer
- Provide warning regarding availability of air in the cylinder
- Prevent inhalation of toxic, poisonous gases and smoke
- Provide means of exhalation of air to the atmosphere

THREE THUMB RULES –

1. The cylinder valve has two positions only, either fully closed or fully opened.
2. Wearer only will operate his cylinder valve.
3. Before donning the face mask the cylinder valve has to be opened**.**

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PRE ENTRY CHECKS ON B.A. SETS

1. Visual inspection
2. Cylinder content check
3. High pressure leak test
4. Whistle warning test
5. Face/ mask seal test
6. Positive pressure / pressure balance test.
7. Supplementary air test

SELF-CONTAINED BREATHING APPARATUS (SCBA)

SCBA required by the regulations should be type approved as per Marine Equipment Directive. SCBA used in incidents involving dangerous goods a positive pressure type mask is required. The volume of air contained in the SCBA cylinders should be at least 1,200 liters. For each of the breathing apparatuses, two complete sets of air bottles are required. These spare bottles are to be in addition to the spare bottles required for fireman's outfit. Passenger ships carrying not more than 36 passengers and cargo ships are equipped with suitably located means of fully recharging the air cylinders free from contamination, passenger ships carrying more than 36 passengers constructed on or after 1 July 2010 shall be fitted with a suitably located means for fully recharging breathing air cylinders, free from contamination. The means for recharging shall be either:

1. Breathing air compressors supplied from the main and emergency switchboard, or independently driven, with a minimum capacity of 60 liters/min per required breathing apparatus, not to exceed 420 liters/min; or

2. Self-contained high-pressure storage systems of suitable pressure to recharge the breathing apparatus used on board, with a capacity of at least 1,200 liters per required breathing apparatus, not to exceed 50,000 liters of free air.

Breathing apparatus provided additional to regulation requirements, which draws its air through a compressed air line from the ship's air supply, independent compressor or independent compressed air cylinders may be accepted provided that the supply is capable of functioning for at least 30 minutes.

The quality of the air produced should be tested annually in accordance with the requirements given. All air cylinders for breathing apparatus must be interchangeable.

The apparatus shall have a suitable warning device that operates when the pressure drops to a predetermined level to warn the wearer. The most common type of warning device is an audible whistle, however, pneumatically or electrically operated devices can also be accepted provided

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they meet the criteria below The warning device shall either be activated automatically when the pressure vessel valve(s) is (are)opened or if manually activated it shall not be possible to use the apparatus before the device is activated. The warning device shall activate at a pressure of (55+/-5) bar or at such higher pressure as will ensure that at least 200 liters of air remain within the pressure
vessel.

LOW PRESSURE ALARM: To be given audio and visual. Alarm to sound when air left in cylinder 200 ltr.

CALCULATION OF TIME:

- 1200 ltr. Fresh air is compressed in cylinder
- Consumption of air 40 ltrs / min.
- Duration of cylinder 1200 / 40 = 30 min
- Warning whistle will give sound when 200 LTR air remain in cylinder
- Safety margin 200 LTR = 05 min.
- Working duration 30 – 5 = 25 min.

Note: For the safety of fire man increase safety margin, decrease working duration

ADDITIONAL REQUIREMENT FOR SHIPS CARRYING DANGEROUS GOODS:
For each of the breathing apparatus, two complete sets of air bottles are required. These spare bottles are to be in addition to the spare bottles required for fireman's outfit.

SMOKE HELMET TYPE BREATHING APPARATUS
With the entry into force of the revised SOLAS chapter II-2 on 1 July 2002, new ships may no longer be fitted with smoke-helmet type breathing apparatus and it is recommended that existing ships built prior to 1 July 2002 be fitted with additional SCBAs to replace, or make redundant, existing smoke helmet type breathing apparatus where these form part of the minimum equipment required. (Unified Interpretation - MSC/Circ.1085)
The above recommendation can be applied to replace existing smoke helmet type breathing apparatus required in SI 1998 No, 1011 (Fire Protection: Small Ships) Regulation 17(7) with SCBAs

SEARCH AND RESCUE PROCEDURES

- Use breathing apparatus with fire proof lifeline
- Work in pair

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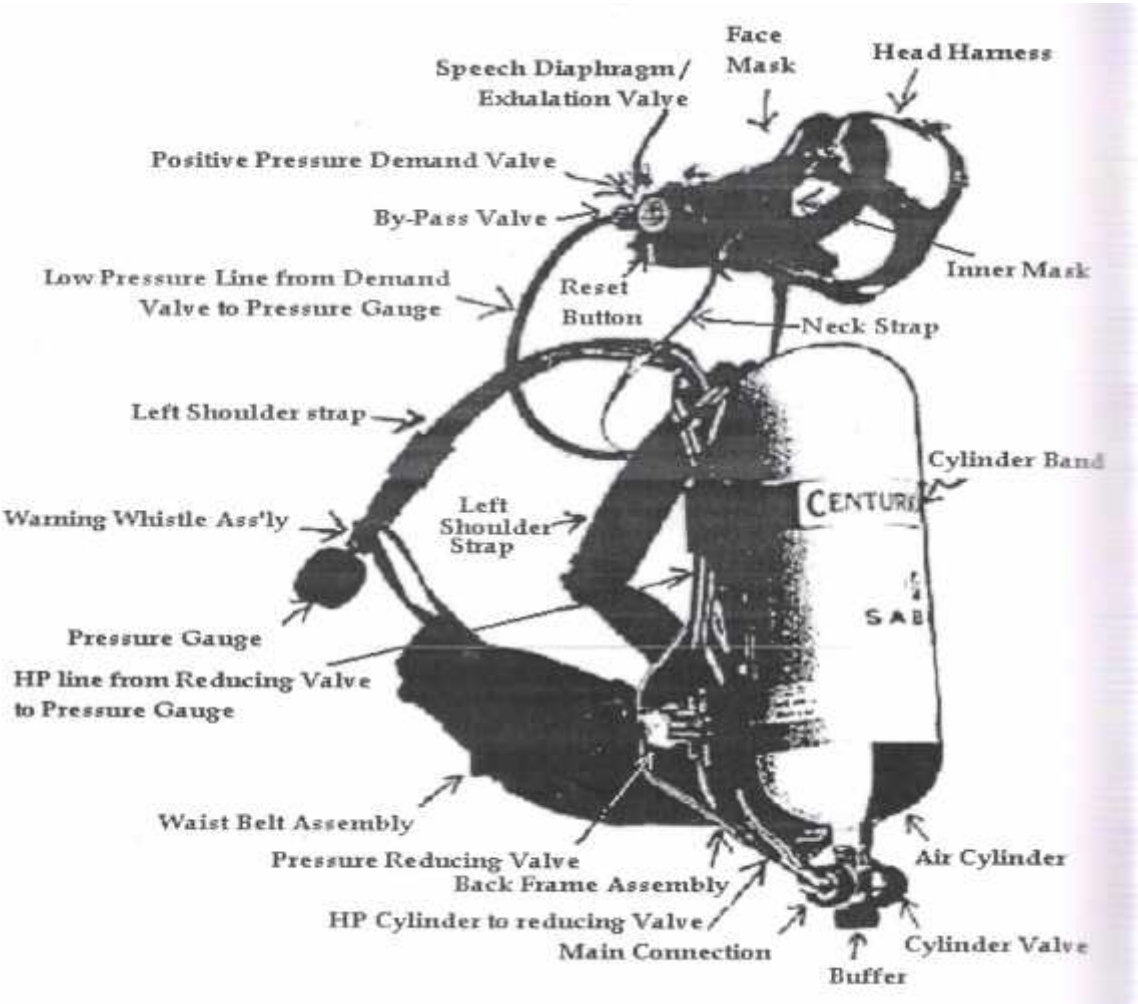
- Use bulkhead for guidance
- Search with feet and back of palm
- Give safe fire man lift to casualty
- Familiar with layout of compartment and ship
- Follow instructions

PARTS OF BREATHING APPARATUS



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SIGNALS ON FIRE PROOF LINE AT SCABA

Given by wearer (Fire man)	Signal on Fire Proof Life Line	Given by attendant (Officer-in-Charge)
I am all right	One pull	Are you all right
Give me slack on lifeline and Fire hose (I want to go ahead)	Two pulls	Giving slack on life line and Fire hose (You can go ahead)
I want to come out (Take slack on life line and hose)	Three pulls (By Fire man)	You can come out (Taking slack on life line and hose)
We are coming out	Three pulls (By officer-in-charge)	Come out
Help me out immediately	Four pull	Come out immediately

EMERGENCY ESCAPE BREATHING DEVICE

The emergency escape breathing device (EEBD) contains breathing oxygen for a time period of at least 10 minutes, along with a low pressure audible alarm (whistle type).

Most of the EEBD manufacturers provide time duration of 15 minutes to escape out from danger. SOLAS requirement is for minimum of 10 min duration; however, EEBD should never be used for firefighting , rescue and inspecting holds strictly to be used for escape only.

PORTABLE AND NON-PORTABLE FIRE APPLIANCES

EXTRACT FROM ASSOCIATTED RULES

FIRE PUMPS, FIRE MAINS, WATER SERVICE PIPES, HYDRANTS, HOSES AND NOZZLES

FIRE PUMPS

- Ships shall be provided with fire pumps operated by power, number of which shall depend upon the type and size of the ship.
- Each pump capable of delivering water through two in number nozzles at
  12 m of jet.

- Discharge capacity of Each fire pumps (other than any emergency pump for cargo ships) shall have a capacity not less than 80% of the total required capacity divided by the minimum number of required

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fire pumps but in any case not less than 25 m^3/h, and each such pump shall in any event be capable of delivering at least the two required jets of water. These fire pumps shall be capable of supplying the fire main system under the required conditions. Where more pumps than the minimum of required pumps are installed, such additional pumps shall have a capacity of at least 25 m^3/h and shall be capable of delivering at least the two jets of water**.**

- Any fire pump shall, when discharging the specified quantity of water through adjacent fire hydrants in any part of the ship from specified size nozzles, be capable of maintaining the specified pressure at any hydrant.
- Relief valves to be provided if pumps are capable of developing pressure exceeding design pressure of fire main and other fittings.

SHIPS SHALL BE PROVIDED WITH INDEPENDENTLY DRIVEN FIRE PUMPS

IN PASSENGER SHIPS

4000 gross tonnage and upwards .... at least 3
Less than 4000 gross tonnage ..... at least 2

IN CARGO SHIPS

1000 gross tonnage and upwards .... at least 2
Less than 1000 gross tonnage ..... at least 2

POWER-DRIVEN PUMPS, ONE OF WHICH SHALL BE INDEPENDENTLY DRIVEN.
WITH TWO PUMPS SIMULTANEOUSLY DELIVERING WATER – PRESSURE AT HYDRANTS

FOR PASSENGER SHIPS

4000 gross tonnage and upwards ..... 0,40 n/mm^2
Less than 4000 gross tonnage ..... 0,30 n/mm^2
FOR CARGO SHIPS
6000 gross tonnage and upwards ..... 0,27 n/mm^2
Less than 6000 gross tonnage ..... 0,25 n/mm^2

AND THE MAXIMUM PRESSURE AT ANY HYDRANT SHALL NOT EXCEED THAT AT WHICH THE EFFECTIVE CONTROL OF A FIRE HOSE CAN BE DEMONSTRATED.

PUMPS IN PASSENGER SHIPS: The quantity of water is not less than two thirds of the quantity required to be dealt with by the bilge pumps when employed for bilge pumping.

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PUMPS IN CARGO SHIPS - Other than any emergency pump: the quantity of water is not less than four thirds of the quantity required to be dealt with each of the independent bilge pumps in a passenger ship of the same dimension when employed in bilge pumping, provided that in no cargo ship need the total required capacity of the fire pumps exceed 180 m^3/h.

HYDRANTS (ISOLATING VALVE/DRAIN)

- The number and position of hydrants shall be such that at least two jets of water not emanating from the same hydrant, one of which shall be from a single length of hose, may reach any part of the ship normally accessible to the passengers or crew while the ship is being navigated and any part of any cargo space when empty, any ro-ro space or any vehicle space in which latter case the two jets shall reach any part of the space, each from a single length of hose. Furthermore, such hydrants shall be positioned near the accesses to the protected spaces.
- In machinery spaces, at least two hydrants, one on port side and one on the starboard side.
- Isolating valves to separate the section of fire main within the machinery space containing the main fire pump or pumps from the rest of the fire main shall fitted in any easily accessible and tenable position outside the machinery spaces.
- Drain valves or cocks to be provided on fire main for use in frosty weather, so that no water remains inside and freezes, thereby blocking the water flow.

SIZE AND TYPES OF NOZZLES

Standard nozzle sizes shall be 12 mm, 16 mm and 19 mm or as near thereto as possible. Larger diameter nozzles may be permitted at the discretion of the Administration.

For accommodation and service spaces, a nozzle size greater than 12 mm need not be used. For machinery spaces and exterior locations, the nozzle size shall be such as to obtain the maximum discharge possible from two jets at the pressure mentioned from the smallest pump, provided that a nozzle size greater than 19 mm need not be used. Nozzles shall be of an approved dual-purpose type (i.e. spray/jet type) incorporating a shut off.

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SEMI-PORTABLE/ MOBILE EXTINGUISHERS

'Mobile' extinguishers are those which exceed the maximum mass of a portable extinguisher, i.e. are more than 23 kg. In general these are expected to be 'transportable', i.e. fitted with wheels, however fixed extinguishers may be accepted where space is limited provided the remainder
of this section can be complied with.
135 liter extinguishers are not required for spaces in cargo ships wherein all boilers contained therein are for domestic services and are less than 175 kW.

POSITIONING:

45 liter foam extinguishers may be arranged outside of the space concerned for smaller spaces of cargo ships.
In case of machinery spaces containing both boilers and internal combustion engines one of the foam fire extinguishers of at least 45 l capacity or equivalent may be omitted on the condition that the 135 l extinguisher can protect efficiently and readily the area covered by the 45 l extinguisher.

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The length of hose on mobile extinguishers should not in general exceed that provided by the makers except where the lengthening of the hose will not reduce the projection of the froth below the distance specified in the Regulations, i.e. 14m for extinguishers of 135 ltrs and over, and 10m for extinguishers of under 135 Ltr. Mobile dry powder extinguishers are not acceptable as the equivalents of mobile carbon dioxide or foam extinguishers. No objection need be raised to their acceptance as additional equipment. When used in conjunction with foam equipment the powder used should be of a foam compatible type.

It is recommended that mobile extinguishers be secured by a band type bracket fitted in halves round the body of the extinguisher with a non-corrodible hinge and securing pin. Whatever method is chosen to secure the extinguisher, it should be capable of ready release without the use of tools.

Because of the deterioration to which the ingredients of foam making liquids are liable at temperatures of 38°C or over, portable foam fire extinguishers should be kept in as cool a place as possible. Additionally, they should not be stowed in a position where the ambient temperature is liable to fall below 0°C. Dry powder and CO_2 extinguishers are generally considered suitable for use at temperatures down to -30°C, but the latter type should not be exposed to corrosive conditions or to a temperature exceeding 60°C. The extinguishing media provided adjacent to any given fire risk should be suitable for the type of fire risk involved.

MOBILE CARBON DIOXIDE EXTINGUISHER

- Provided with internal discharge tube, and a valve to release the gas.
- Discharge hose to withstand a pressure of 122 bar (bore of the discharge hose to be not less than 9 mm dia. For 16 kg or 12 mm dia for 45 kg.) and provided with a horn of electrical non-conducting material. Operating handle to be sheathed to protect the hand to operation from extreme cold.
- At temperature between 15-18 ° C, 75% of capacity to be discharged in 30-45 sec. for 16 kg. And in 60-90 sec. for 45 kg extinguisher.
- Distinctive marking for the maker, capacity, operating instruction, weight of empty and filled cylinder, year of manufacture and test pressure.

MOBILE DRY POWDER EXTINGUISHER

- Constructed of suitable material and of sufficient strength.
- Provided with a nozzle and reinforced discharge hose constructed to withstand four times the maximum working pressure (as specified).
- Gradual release of residual pressure when the cap / covers are being

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removed.

- Protection of all pars against corrosion.
- Provided with a suitable device to control discharge as required.
- Actuating mechanism to be protected against inadvertent operation.
- Capable of discharging at least 85% of dry powder charge when operated under normal conditions. Discharge rate not less than 1 kg/ sec.

RECHARGING: Only refills approved for the fire extinguishers in question shall be used for recharging.

PORTABLE FOAM APPLICATOR UNIT

- Provided with an induction type of air foam nozzle capable of being connected to the fire main.
- Portable tank containing 20 liters of foam concentrate with facility for connecting to nozzle.
- Spare foam concentrate.
- Foam expansion ratio not to exceed 12:1

FIREMAN'S OUTFIT -

- Ships to be provided with the required number of fireman's outfit depending upon size and type.
- So stored as to be easily accessible and ready for use.
- If more than one such set is carried, they shall be stored in widely separated positions.
- Ship shall carry at least two fire fighting suit.
- Passenger ships carrying more than 36 passengers additional two additional required and for each pair of BA Sets one water fog applicator.

A FIREMAN'S OUTFIT SHALL CONSIST OF : 1. Fire suit 2. Fire axe 3.helmet 4. Fire boot 5. SCBA 6. Explosion proof light 7. Life line

PERSONAL EQUIPMENT, COMPRISING

- Protective clothing of material to protect the skin from the heat radiating from the fire and from burns and scalding by steam. The outer surface shall be water proof.
- Boots and gloves made of electrically non-conducting material.
- Rigid helmet for protection against impacts.
- Electric safety lamp with a capacity to work for minimum three hours.

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- An axe to the satisfaction of the administration.

LIFELINE AND SAFETY BELT HARNESS

Each breathing apparatus should be provided with a flexible fireproof lifeline, type approved to meet the testing standards quoted in the Marine Equipment Directive, of at least 30 m in length, capable of being attached by means of a snap hook to the harness of the apparatus, or to a separate safety belt, in order to prevent the breathing apparatus becoming detached when the lifeline is operated. The lifeline should be subjected to a test by static load of 3.5 kN for 5 minutes.

Snap hooks should be of materials, so far as possible, resistant to incendive sparking on impact. Care should be taken to ensure that the lifeline is free from knots, as their presence may seriously reduce the strength of the line under load.

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Ship's Fire Fighting Organization

FIRE PLANS
(FIRE CONTROL PLANS)

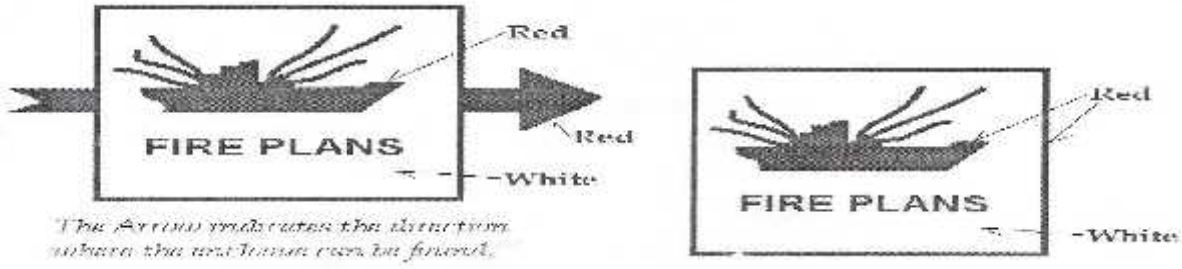
All new and existing ships are required to be provided with 'Fire Control Plans' (or a booklet) for assistance of shore side fire fighting personnel.

The fire control plans to be :

- Permanently stowed in a prominently marked watertight enclosure outside the deckhouse.
- Located/positioned for ready access at a well illuminated position with due considerations to the affects of any expected fire, and marine environment
- Capable of being easily opened.
- Kept up to date with latest alterations
- Duplicate copies kept on the bridge and exhibited for guidance of master and officers

The enclosure is to be read and location to have sign of not less than 297 X 400 mm with red ship silhouette on white background. If the enclosure is not adjacent to the gangway, there should be appropriate guide signs to help the shore personnel to find the enclosure.

Sign on the Enclosure



A general arrangement plans showing clearly for each deck the following –

- Position of the control station
- Sections of the ship which are enclosed by fire resisting bulkheads
- Location of fire alarms, and fire detection system
- Sprinkler installations
- Location of Firemen's outfits
- Fire Extinguishing appliances
- Means of access to various compartments and decks in the ship
- Ventilating system including particulars of the master fan controls
- Position of dampers and identification numbers of the ventilating fans serving each section of the ship
- Location of the international shore connections, and Position of all remote

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controls mentioned below

Fire control plans chart/ booklet for assistance of shore side fire fighting personnel, It is prominently in watertight enclosure outside the deckhouse.

ACTION TO BE TAKNE IN CASE OF FIRE

- Alarm to bridge (control station)
- Fire alarm from Control Station (Bridge), Fire alarm response.
- Muster at Muster Station.
- Role of Team Leaders.
- Role of Bridge (Command) Team
- Role of Emergency Team I & II
- Role of Support Team
- Role of Backup / First Aid Team
- Communication system
- Personnel Safety Procedures
- Periodic Ship Board Drills
- Fire Patrol System
- Fire Control Plans
- Fire Watch

TEAM FORMATION

- Persons without any specific duty shall muster with support team
- Supernumeraries muster on the bridge

➢ **ALARM TO BRIDGE (CONTROL STATION)**

When anyone sees fire, give information to control station by shortest and suitable methods, tell clearly what you found, try to restrict and start extinguishing the fire.

➢ **FIRE ALARM FROM BRIDGE (ALARM RESPONSE)**

On hearing alarm all personnel must assemble with – Life Jacket, put on long sleeved boiler suit, safety shoes and hard helmet and proceed immediately to their muster station. Watch keepers to remain on watch until relieved by emergency team members.

➢ **MUSTER STATION**

Muster stations shall be provided close to the embarkation deck. Each muster station shall have sufficient clear deck space to accommodate all persons assigned to muster at that station, but at least 0.35 m^2 per person. Muster and embarkation stations shall be readily accessible from accommodation and work areas. Muster and embarkation stations shall be adequately illuminated by lighting supplied from the emergency source of electrical power. Muster station depend upon type and size of ship (location)

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- **ROLE OF TEAM LEADERS**

- All team leaders must be capable of carrying out task assigned to any member of team
- The team leader should muster their teams and give report to control station
- Team leaders should never get so involved in actual operation that control on team member is lost.
- Team leader must ensure that his team is well trained and that the members have confidence and know each other's capabilities.

- **ROLE OF BRIDGE TEAM**

Bridge team is responsible for command and control through proper assessment of the situation appropriate action and maintaining communication (internal and external).

- Master will be over all in charge.
- Ensuring that an efficient muster of all personnel is carried out.
- Stop engine / stand by turning the ship as necessary.
- Record keeping.
- Organizing a search party for any missing personnel.
- Pass message to Owner, Company, Nearest Vessel or Port about the emergency.
- Internal communication must be operational (kept on)
- Issue walkie talkies, radio sets to all muster stations.

- **ROLE OF EMERGENCY TEAM I & II**

- Both emergency teams will put on fireman's outfit and be stand by
- Accounting team members and reporting to the command centre
- Taking action as directed.
- Maintaining feedback
- One party will be in operation and second will be stand by. When first team is tired the second team will take over the duty and start extinguishing the fire. First team will stand by.

- **ROLE OF SUPPORT TEAM**

- Accounting team members and reporting back to command
- Taking action as directed
- Preparing men and equipment for action and reporting readiness
- Maintaining feedback
- Support team is responsible to supply fire fighting medias and equipments, hoses, sand, fire blankets and BA set air cylinder after charging.
- This team is responsible to lower life saving appliance up to deck level and life rafts etc.

- **ROLE OF THE BACK UP TEAM / FIRST AID TEAM**

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- When the support team is busy with life saving appliances both teams will start supplying extinguishing medias if no casualty.
- Both teams will start extinguishing fire by suitable methods.

➢ **COMMUNICATION SYSTEM**

Communication systems are of two types –

- Internal Communication
- External Communication
- **FIRE PATROL - T**wo-way portable radiotelephone apparatus each member of the fire patrol shall be provided with a two-way portable radiotelephone apparatus

FIRE WATCH

- After extinguishing fire one party is kept on watch/ inspections who will take necessary action in case re-ignition of fire takes place.

- **FIRE FIGHTER COMMUNICATION -** Amendments to SOLAS regulation ii-2/10 on fire fighting enter into force on 1 july 2014, to require a minimum of two two-way portable radiotelephone apparatus for each fire party for fire fighters' communication to be carried. the apparatus shall be of an explosion-proof type or intrinsically safe. ships constructed before 1 july 2014 shall comply with the above requirements not later than the first survey after 1 july 2018.

An example of Emergency Response Teams: Personnel and their duties --

Emergency Response Teams

Bridge Team	Emergency Team 1	Engine Room Team	Emergency Team 2	Support Team
Master : in command	**Chief Officer :** Leader or **Chief Eng. :** Leader	**Second Engr.** : Leader	**2nd Offr. :** Team Leader	**Catering Officer :** Leader
3/O : Record keeping and Internal Communication **R/O :** External Communication **Rating :** helmsmen **Rating :** lookout / messenger Unassigned Officers	**Pretty Officer :** BA squad **Rating :** BA squad **Rating :** hose party **Rating :** hose party **Electrical Officer :** as directed	**3rd / E :** Deputy **Petty Officer :** BA squad **Rating :** BA squad **Rating :** hose party **Rating :** hose party	**4th Engr.** Deputy **Petty Officer :** BA squad **Rating :** BA squad **Rating :** hose party **Rating :** hose party	**Pretty Officer :** as directed **Rating :** as directed **Rating :** as directed

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Note – In case of emergency in engine room 2nd engineer to lead, For emergency on deck will be lead by chief officer

Other factors to bear in mind are : Secondary stations, initial action of officers on watch, location of the vessel (at sea, in port, anchorage, dry dock) flexibility in varying circumstances (fire, explosion, grounding, man over board, etc.) and location of emergency (engine room, deck, accommodation, pump room, etc.). All such factors must be well discussed, clarified, and communicated to all concerned.

PERSONAL SAFETY PROCEDURES

- Knowledge of theory of fire
- Safe working practice
- Good house keeping
- Clean Ship to prevent spontaneous combustion
- Proper training (Theory / Practical)
- Everyone must have responsibility to avoid emergency (Fire)
- Switch off or close the fuel valve on completion of work
- No Smoking at unauthorized spaces
- No smoking in beds / cargo holds
- Electrical fitting (Cables) not to be over loaded
- Use proper fuse wire
- Laundry spaces iron plug must be removed after use
- Prevent oil leakage on hot surface and proper storage of combustible materials
- Regular drills and exercise
- Prepare checklist while doing hot work
- Suitable screen / guards must be used to prevent falling of hot metal
- Do not throw ignited cigarette ends overboard
- Never put wet cloth on the electrical motor or lampshade
- All pipes to be lagged
- Keep the engine room platform clean and dry

PERIODIC SHIP BOARD DRILLS

Fire drills are to be carried out regularly in accordance with National Regulations.

OBJECTIVE

- To prepare a trained and organized response to situations of great difficulty which may unexpectedly threaten loss of life at sea.
- Personnel should know what to do in case of fire.
- Their muster stations.

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- Check serviceability of fire fighting equipments and their location.
- Train the crew how to operate the extinguishing medias and their effect on burning substance.
- An abandon ship drill and a fire fighting must be held within 24 hours of leaving port if more than 25% of the crew have not taken part in drills on board the ship in the previous month. As soon as possible, but not later than two weeks after joining the ship.
- Personnel should muster wearing life jackets properly secured.
- Any defects or deficiencies revealed during drills and the inspections, which accompany them, be made good without delay.
- **MSC 92 ADOPTED AMENDMENTS SOLAS REGULATION III/19 TO REQUIRE MUSTERS OF NEWLY EMBARKED PASSENGERS PRIOR TO OR IMMEDIATELY UPON DEPARTURE, INSTEAD OF "WITHIN 24 HOURS", AS STATED IN THE CURRENT REGULATIONS. THE AMENDMENTS ARE EXPECTED TO ENTER INTO FORCE ON 1 JANUARY 2015.**

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FIRE FIGHTING METHODS

KNOWLEDGE OF FIRE SAFETY ARRANGEMENTS

- Knowledge of fire theory
- Regular drills/ training
- Knowledge of safety escape routes
- Preparedness for fire emergency
- Knowledge of dangers
- Regular inspection and maintenance
    - Fire alarm and maintenance
    - Fixed Extinguishing Equipments
    - Portable/ mobile Extinguishers
    - Breathing Apparatus
    - Fire Man's Apparatus
    - Fire Man's outfits
    - Emergency Escape Breathing Device (EEBD)

FIRE ALARM AND ACTION TAKEN

Action to be taken in case of fire informing control station. First we have to find type of fire, place of fire, how long and anybody trapped, then inform to control station. Restrict the fire by stopping Air/Oxygen, cooling, starving and cutting molecular chain reaction.

FIRE FIGHTING

Use proper extinguishing Medias and be careful unsuitable medium may react to the burning substances. Do not allow fire to spread. Before starting the operation of fire fighting switch off electrical supply of that area. Fire fighting methods are four.

- By removing Fuel - Starving
- By removing Heat - Cooling
- By removing Oxygen - Smothering
- By stopping MCR - Inhibiting (B.C.R.)

The word 'Fire' itself guides us to a logical action as the success of the entire operation depends upon leadership (Command, Control, Co-ordination and Communication).

F - Find / Feel
I - Inform / Investigate
R - Restrict
E - Extinguishments, if not able to extinguish or control - escape

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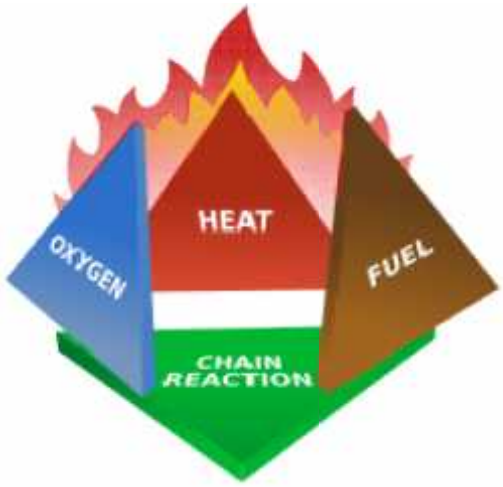
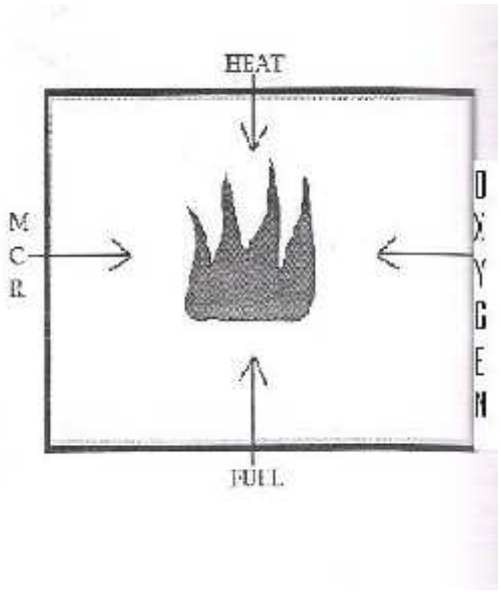
FIND

- What is burning?
- Where is it (Location)?
- How long has it been burning?
- Any one trapped?
- Where is it likely to spread/ special circumstances/ dangers?

INFORMATION TO CONTROL STATION

- By shouting "Fire" "Fire"
- By alarm
- By Telephone, Walkie/ Talkie, Radio set
- By messenger (to control station)





EXTINGUISHMENTS

Use proper extinguishing media, (must know reactivity of extinguishing media on burning substances)

RESTRICT

- By removing Fuel – Starving
- By removing Heat – Cooling
- By removing oxygen – Smothering

By stopping MCR – Inhibiting (B.C.R.)

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MACHINERY SPACE FIRE-

MEANS OF STOPPING MACHINERY, SHUTTING OFF OIL FUEL SUCTION PIPES AND CLOSING OF OPENINGS /VENTS / FLAPS

- Means for stopping ventilation fans serving machinery, accommodation and cargo spaces, oil fuel transfer pumps, oil fuel unit pumps and other similar pumps.
- Means of closing all skylights, doorways ventilators, annular spaces around funnels and other openings to such spaces
- Means to permit the release of smoke from machinery spaces
- Valve or cock (quick closing) on every pipe connected to any oil fuel or lubricating oil storage, settling, or daily service tanks, not being a double bottom tank, which if damaged would permit discharge of the contents so as to cause a fire hazard.

Such means to be capable of being operated from outside the said spaces and which would not be made accessible by a fire within such spaces. The controls shall be capable of stopping such machinery or pumps in the event of fire in such spaces.

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PROCEDURE FOR FIRE FIGHTING -

SHIP AT SEA

- Raise Fire alarm, continuous ringing on ships bell.
- Crew assembled at fire stations as per muster list.
- Fire party is assembled and prepared for action-as per orders tom the bridge / master.
- Ships course and speed altered - as necessary to assisting fighting / containing the fire.
- Fire pumps started and ships fire line activated. Fire hoses with nozzle rigged up.
- Firefighting initiated.

ADDITIONAL PROCEDURE IN PORT

- Call the port fire brigade
- Inform port authority
- Confirm that port fire brigade will charge
- Port authority to inform of hazards to the dock installation. Evacuate non-essential personnel.
- Make preparation to leave port, if required on power or with the help of tugs.

ALARMAND INTIAL RESPONSE

- Irrespective of whether the vessel is at sea, anchor or in port on hearing emergency alarm, all ship's personnel muster at their emergency station with their lifejacket in long sleeve boiler suit safety shoes and safety helmet.
- The team leaders muster the teams and report is made to the master regarding any missing person or absent.

Construction

To prevent fire spread ships are designed in such a way that fires can be contained as far as possible. According to SOLAS regulations ships have to comply with the following:

- Division of the ship into main vertical zones by thermal and structural boundaries.
- Separation of accommodation from the rest of the ship by thermal and

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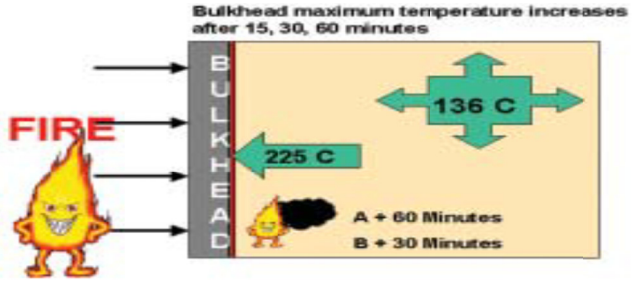
structural boundaries.

- Restricted use of combustible materials.
- Detection of the fire in the zone if origin.
- Containment and extinguishing of any fire in the space of origin.
- Protection of means of escape or access for firefighting.
- Ready availability of fire extinguishing appliances.
- Minimize the possible ignition of flammable cargo.



Heat transfers through the bulkhead

A-class division

Constructed of steel or other equivalent material and suitably stiffened.

Capable of preventing the passage of smoke and flames for one hour

Be insulated such that the unexposed side will not rise in temperature more than 139° Celsius nor at any one point more than 180° Celsius above original temperature within the time (see following page)

Class A-60 60 minutes

Class A-30 60 minutes (after 30 minutes T > 139° C.)

Class A-15 60 minutes (after 15 minutes T > 139° C.)

Class A-0 60 minutes (after 0 minutes T > 139° C.)

B-class division

Division formed by bulkheads, decks, ceilings or linings.

- Capable of preventing the passage of smoke and flames for the first half hour.
- Be insulated such that the unexposed side will not rise in temperature more than 139° Celsius nor at any one point more than 225° Celsius above original

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temperature within the time listed.

Class B-30 30 minutes (after 30 minutes T > 139° C.)

Class B-15 30 minutes (after 15 minutes T > 139° C.)

Class B-0 30 minutes (after 0 minutes T > 139° C.)

C-class division

Constructed of approved noncombustible materials preventing the passage of smoke, flames or rise in temperature on exposed surfaces.

F-class division

Class F is equivalent to Class B.

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PERSONAL SAFETY AND SOCIAL RESPONSIBILITY *COURSE HANDOUT*

(IMO Model Course 1.21/STCW A-VI/1)

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CONTENT

Section	Details	Pages	Revision	Date
A	Content	1	00	01-Feb-2018
B	Revision Record	1	00	01-Feb-2018
C	Course Outline	1-4	00	01-Feb-2018
D	Introduction	1	00	01-Feb-2018
01	Observe safe working practices	1-23	00	01-Feb-2018
02	Contribute to effective human relationships on board ship	1-6	00	01-Feb-2018
03	Contribute to effective communication onboard ship	1-7	00	01-Feb-2018
04	Comply with emergency procedures	1-11	00	01-Feb-2018
05	Take precautions to prevent pollution of the marine environment	1-9	00	01-Feb-2018
06	Contribute to effective human relationships onboard ship (Concluded) - Social responsibilities	1-8	00	01-Feb-2018
07	Understand and take necessary action to control fatigue	1-14	00	01-Feb-2018

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Section	Details of Revision	Revision No.	Date

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LOYALTY MARINE EDUCATION TRUST

Personal Survival and Social Responsibilities (PSSR)

Class Routine

Sr. No	Subject	Hours			Total Hrs.	Day
		Lecture / Slides	Demo & Pract	Films		
1.	Observe safe working practices 1.1 Introduction 1.2 Importance of the course 1.3 Ship familarization 1.4 Nature of Shipboard hazards 1.5 Groups the equipment provided onboard to counter these hazards 1.6 Use and demonstration of PPE 1.7 List operations that take place onboard which can be hazardous 1.8 Loading and unloading of cargoes 1.9 Mooring and unmooring 1.10 Enclosed spaces 1.11 Hot work 1.12 Working aloft 1.13 Engine room watch keeping and maintenance	10 mins 10 mins 20 mins 10 mins 10 mins 5 mins 10 mins 15 mins 20 mins 10 mins 20 mins	10 mins	30 mins	3 hrs	Day 1
2.	Contribute to effective human relationships on board ship - 2.1 Human relationships onboard ship 2.2 Interpersonal relationship 2.3 Team building 2.4 Team working skills and conflict resolution	30 mins 60 mins 60 mins		30 mins	3 hrs	Day 1

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3.	Contribute to effective communication onboard ship 3.1 Fundamentals of communication 3.2 Methods of communication 3.3 Barriers in communication 3.4 Effective transmission skills 3.5 Effective listening skills 3.6 Effective and consequences of wrong communication 3.7 Communication sum-up	30 mins 20 mins 10 mins 10 mins 20 mins 30 mins 10 mins		50 mins	3 hrs	Day 1 Day 2
4.	Comply with emergency procedures 4.1 Explain the term 'Emergency' 4.2 Types of emergency : collision, fire, foundering 4.3 Shipboard contingency plans for respond to emergencies 4.4 Action to take on discovering potential emergency including fire, collision, foundering and ingress of water into the ship 4.5 Drills and Muster 4.6 Value and need of drills and training 4.7 Knowledge of escape routes and internal communication and alarm system	15 mins 25 mins 20 mins 60 mins 30 mins 30 mins		60 mins	4 hrs	Day 2

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5.	Take precautions to prevent pollution of the marine environment 5.1 Define the term pollution 5.2 Describe the industries dependent on the marine environment, namely fisheries, coastal tourism, coastal urban development 5.3 Basic knowledge of complexity and diversity of the marine environment 5.4 Explain how marine pollution results in an economic loss to these industries 5.5 Describe the overall contribution, and effects to global marine pollution from ship operations. 5.6 Introduction to International measures undertaken for prevention of marine pollution from ship operations, namely MARPOL 73/78 (Annexes 1 to VI) 5.7 Introduction to Ballast Water Management, Anti Fouling systems 5.8 Contents of Oil Record Book	10 mins 10 mins 20 mins 10 mins 10 mins 20 mins 20 mins		20 mins	2 hrs	Day 2 Day 3
6.	Contribute to effective human relationships onboard ship (Concluded) - Social responsibilities 6.1 Rights and obligation of crew 6.2 Employment conditions etc 6.3 Drugs and alcohol 6.4 Health and hygiene onboard 6.5 Summing up	30 mins 30 mins 30 mins 30 mins		60 mins	3 hrs	Day 3

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7.	Understand and take necessary action to control fatigue 7.1 Highlights accidents and incidents that have been attributes to fatigue and lack of adequate rest 7.2 Explain the importance of obtaining the necessary rest 7.3 Describes the effects of sleep, schedules and circadian rhythm on fatigue 7.4 Describe the effects of physical stressors on seafarers 7.5 Highlights the environmental stressors which have the potential to effect performance of seafarers 7.6 Describe the schedule changes on seafarers fatigue 7.7 List measures that can be taken to reduce fatigue and stress on board	20 mins 10 mins 20 mins 20 mins 10 mins 20 mins 20 mins			2 hrs	Day 3
	Review and Assessment	60 mins			1 hr	Day 3
	Sub Total	**16 hrs 40 mins**	**10 mins**	**4 hrs 10 mins**	**21hrs**	

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1. Aim

This model course aims to meet the mandatory minimum requirements for seafarers for familiarization, basic safety training and instruction in accordance with section A- VI/1 of the STCW Code.

2. Objectives

Due to the vastly different environment on a ship as compared to ashore, this course is designed to prepare a new recruits for a life at sea. Working on a ship can be hazardous occupation for the uninitiated. This course will give new seafarers an insight into the various elements of a ship and working procedures on board so that they adjust to the shipboard environment, and are better prepared to cope with any unforeseen circumstances. To that extent this course is planned to make their transition from a shore to a sea career smooth and give some knowledge of ship's working before they actually step on board a ship.

A trainee successfully completing this course will be able to:

- Comply with emergency procedures
- Take precautions to prevent pollution of the marine environment
- Observe safe working practices
- Understand orders and be understood in relation to shipboard duties
- Contribute to effective human relationships on board ship

3. Entry Standards

This course is mandatory for all seafarers serving on board sea-going ships.

4. Required Attendance

100% attendance is required for successful completion of the course.

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CHAPTER 1

GENERAL SEA TERMS

Introduction

Every profession and trade uses its own technical terms to describe the more parts of its work, nowhere is this more evident than in the language of the seaman. English used by the British seaman have in the course of time has become part of the language. This is because so many of the inhabitants of our small island kingdom born and bred near the sea, and because no other country has so far so long been for its existence and prosperity on its Royal and Merchant Navies. To learn, the seaman must first understand the more general nautical terms and expressions explained in this Chapter. Others, more technical, are included in the chapters on at aspects of seamanship to which they are applied.

Terms Relating to a Ship- Parts of a Ship

The Hull

1) The main body of a ship is called the hull. It is divided approximately into three - the fore part, the mid ship part and the after part. The fore part ends in the stern, the after part in the stem. When standing anywhere inside the hull a man is facing forward when he faces the stem and facing aft when he faces the stem.

Parts of the Hull

2) Any line which runs lengthways in the ship is said to run fore and aft and the line joining the middle of the stem to the middle of the stem is called the fore and aft centre line (middle line or centre line in ship's plans and drawings).

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PERSONAL SAFETY AND SOCIAL RESPONSIBILITIES

1.3 Ship familiarization

1. Identifies likely hazards concerning
- gangway and safety net
- main deck
- holds and hatches
- forecastle and poop deck
- windlass, anchors and winches
- cranes or derricks
- manifold and deck pipeline system (on a tanker)
- accommodation
- bridge
- engine- room

1.4 Nature of shipboard hazards

1. lists the various shipboard hazards as:
- slips, trips and falls due to slippery surfaces (oil, grease, garbage, water, ice etc.) or obstructions (pipelines, welding cables, lashing eyes, wires, ropes, etc.,)
- head injuries due to low doorway entrances, overhead loads, failing equipment or material, etc.
- falls through open manholes, unfenced ' tween- decks' , loose or missing gratings, etc.
- clothing, fingers, etc. getting caught in moving machinery such as grinding wheels, winch drums, gears, flywheels, etc.
- burns from steam pipes, hot machinery, welding sparks etc.
- eye injuries through chipping, welding, chemicals, etc.
- injuries and sliding/ fall of unsecured equipment due to ship movements in rough weather
- hazards of extreme weather
- lack of oxygen in confined spaces
- presence of hydrocarbon gas and toxic gases
- hazards of chemicals used on board
- fire
- collision/ grounding/ flooding/ sinking
- pirates and stowaways

1.5 Groups the equipment provided on board to counter these hazards and list the items in each group

1. Personal protective equipment:
- helmet
- goggles

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- gloves
- safety shoes
- dust masks and respirators
- protective clothing
- self- contained breathing apparatus

2. Life- saving appliances:
- life jackets
- lifebuoys
- life rafts
- lifeboats
- line -throwing apparatus
- EPIRBs and SARTs
- TPAs and immersion suits

3. Fire- fighting appliances:
- fire hoses, nozzles, hydrants and fire main
- portable fire extinguishers
- fire axe
- fire-detecting system

4. Medical equipment
- resuscitator
- stretcher
- medicines
- medical equipment

5. Oil Spill equipment
- absorbent pads
- absorbent rolls
- chemical dispersant
- sawdust, brooms, dust pans, shovels and barrels

1.6 **Use and demonstration of PPF:**

1. Head Protection:
- importance of the helmet
- parts of the helmet and functions of each part
- when to use the helmet
- care of the helmet

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2. Gloves:

- necessity for gloves
- types of gloves and suitability of each type for different jobs

3. Eye protection:

- importance of eye protection
- causes of injury to eye
- types of eye protection and differentiation between them

4. Ear Protection:

- danger of excessive noise
- types of ear protection

5. Respiratory protection:

- need for respiratory protection
- types of respiratory protection and suitability for use
- description and checks prior to use of SCABA

6. Safety footwear:

- need for safety shoes
- features of a safety shoe and differences from an ordinary shoe

7. Safety harness

1.7 Lists operations that take place on board which can be hazardous to personnel or ship

- loading/ unloading of cargoes
- mooring
- working aloft
- handling of chemicals
- engine- room watch keeping and maintenance
- lifting loads (manually and mechanically)
- entry into enclosed spaces
- hot work
- anti- piracy and stowaway operations

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Mooring operations

Considerable care is required with the stowage of wires and ropes as well as maintenance of the roller fairleads, bits, winch, drums, brakes and clutches.

Ropes and wires should be regularly inspected and maintained. They should be carefully stowed, preferably of the deck on pallets or the like, and kept away from the moisture, chemicals and other substances which may harm them. Ropes and wires should be protected from direct sunlight whether they are stowed on deck or on reels or drums. Wire ropes should be treated with suitable lubricants, which should be worked into the core of the wire to avoid the rope drying out.

When handling wires and ropes, seafarers should wear leather- palmed gloves to prevent hand injuries. However when turning ropes on drums ends, extreme care should be exercised as gloves could become entrapped. On such occasion's seafarers may wish to remove gloves. Ropes and wires should be flaked out on the deck prior to port arrival and arranged to help the operation go as smoothly as possible. Personnel should never stand in the bite or ropes. Sufficient personnel should be assigned to the mooring operation and one person should be designated as winch/ windlass driver.

Whilst responsible for driving the winch he should remain at the control station and in close communication with the officer in charge. All seamen should be aware of the potential hazards and remain in positions of safety whenever possible. Care should be exercised when throwing heaving lines to avoid hitting people with the " monkey-fist"!

It should be remembered that nylon, polyester and polypropylene ropes, unlike natural fiber ropes, give no auditable indications of imminent failure due to over loading. If it appears that ropes are coming under excessive strain the load should be reduced. When a rope is being run on the drum end a maximum of three turns should be used and one man should control this, with another coiling the rope as it comes off the drum end.

When alongside, the moorings should be constantly monitored and sufficient personnel allocated to tending and adjusting moorings. This is particularly relevant in tidal waters and on vessels with high loading and discharging rates.

On some vessels, mooring operations can be quite awkward, and on others, such as long haul traders, they can be a rare operation. In either case, the operation should be well planned and all personnel involved should be familiar with the proposed sequence of events and what o do in the event of unforeseen

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circumstances arising.

C. **Preparation for Breathing. The following preparations must be made before a ship goes alongside:**

1) Fake out springs., breasts and head and head and stern ropes.
2) Position fenders ready for use.
3) Prepare the brow and its gangway position.
4) Rig ensign staff and jack staff.
5) Provide stoppers.
6) Make up heaving lines for throwing.
7) Provide bollard strop and slip (if required)
8) Provide axe, maul and baulk of timber, forward and aft.
9) Prepare both anchors ready for letting go.
10) Provide line recovery grapnels.
11) Provide Handy Billy (for middling breathing lines).
12) Provide rat guards.

D. **Securing Alongside:** When a ship goes alongside, the breathing ropes required for working the ship to her berth will normally be a lead rope. Stern rope, one head spring and one back spring, and perhaps two breast ropes. The Fair lead in which they will go out depends upon the circumstances, but each berthing hawser required for working the ship should be ready flaked down for running. Its bollard & led out through the correct fairlead, then back inboard where it will be ready for a heaving line to be bent to it by the time the ship is within heaving distances of the jetty. If the capstans are going to be used, it will probably be for breasting the ship in with the breast ropes, or for adjusting her distance along the jetty with the head and stern ropes. When a ship is secured alongside in a tideway, particular attention must be paid to her berthing hawsers as she rises and falls with the tide, and whenever possible, the hawsers should belayed that they can be adjusting without disturbing another. A berthing hawsers may be doubled up by a bite of the same hawser between ship and shore; such hawsers are usually singled up as soon as the brow is removed when the ship is due to unberth. A berthing hawser may also be rove doubled when there is nobody on shore to cast it off when the shop unberth both ends of the hawser are made fast inboard.

Note: The following points are applicable when berthing"

1) The procedure for doubling-up the berthing lines is as follows hold the first line on the capstan, pass and turn up the second line, then transfer the first line from the capstan to the bollards. At no point should the ship be held only by a stopper.
2) Chafing pieces must be correctly positioned at fairleads, bollards and bad

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nips.

3) Rat guards must be positioned on all lines.

E. **Casting off:** When a ship leaves a jetty, the number of berthing however required will depend upon circumstances, but normally the head and stern ropes and one head and one back spring suffice. The head and stern ropes may have to be brought to the capstans and the springs may have to be brought to the capstans and the springs may have to be surged. When a ship is being warped (moved along the jetty without her engine) by her berthing hawsers each hawser should be tended, and the hands tending them should back up, surge, take down the slack, bring to the capstan, or belay them, as required.

ENTERING ENCLOSED SPACE

Remember

The air we breathe contains : 21% Oxygen
: 78% Nitrogen
: 1% Mixed gases

BEFORE ENTRY:

1. Always start ventilation of enclosed space well before entry.
2. First test space with OXYGEN ANALYSER required reading 21%
3. Then check atmosphere with COMBUSTIBLE GAS INDICATOR (Explosive meter).
4. Check for other toxic gases where appropriate using correct instruments.
5. Ensure no gas will enter from other sources.
6. Establish communication links.
7. Have breathing apparatus, resuscitation and rescue equipment checked and immediate use.
8. Complete the ENTRY CHECK LIST.

DURING ENTRY:

Maintain ventilation. Maintain communications. Maintain atmosphere checks.

IMPORTANT:

Compressed air breathing apparatus must be worn if above conditions cannot be assured .

NEVER ENTER AN ENCLOSED SPACE ALONE AND ALWAYS OBSERVE SAFE ENTRY PROCEDURES

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Entering Enclosed Spaces: Procedures & Precautions

The atmosphere of any enclosed or confined space may be deficient in oxygen or contain flammable or toxic fumes. These conditions may put at risk the life or health of the persons entering it. The enclosed spaces where entry precautions are required include: cargo holds, DB tanks, pump room, fuel and ballast tanks, cofferdams and duct keel, stool spaces, pipe trunks, battery and chain lockers and CO2room. For man entry, the space must be checked for oxygen, hydrocarbons and toxic gases. The requirement for man entry is 21% oxygen and 1% of LEL for hydrocarbon gases and if the entry is the purpose of hot work then in addition to 21% oxygen, the hydrocarbon content should remain zero.

The enclosed space must not be entered unless the following precautions have been taken :

The atmosphere of the space is tested for oxygen content with oxygen analyzer HC content with explosive meter/ tank scope & toxic gases with multi gas detectors.

- A responsible person is designated to take charge of the operation.
- All potential hazards, relevant to that space are identified.
- Enclosed space entry permit is duly filled.
- Procedures before and during the entry are followed.
- Ventilation must be continued while the manpower is inside.

Oxygen deficiency in a hold occurs due to rusting , which consumes oxygen, carriage of some oxygen absorbing cargoes like concentrates or after inerting. Oil cargoes may contain toxic gases such as hydrogen sulphine, benzene, & carbon monoxide which remains in tank along with hydrocarbon vapour after discharge. Some chemicals are absorbed through skin.

The space to be entered should be guarded against ingress of harmful vapours by positively blanking off pipelines leading to the space. The space should be thoroughly cleaned to avoid deposits/sludge which give off dangerous fumes. The sampling of these gases should be done at various vertically and horizontally scattered locations to detect and remove any concentration of gases. The officers on watch watch should be informed of any space, which is to be entered so that he does not stop the fans, open remote operated valves or close the escape doors. Warning notices should be placed on the relevant controls or equipment. Access to and within the space should be well Illuminated.

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Rescue and resuscitator equipment should be placed ready for use at the entrance to the space. The number of person entering space should be limited to those who actually need to enter. Communication link up to the bridge or CCR should be maintained and checked at frequent intervals. If unforeseen difficulties or hazards develop, the work should be stopped and the space evacuated so that the backup is immediately available.

The importance of regular rescue drills cannot be over emphasized to prove the ship's rescue plans under difficult and different circumstances. Anyone likely to use breathing apparatus should be thoroughly familiar and confident with its use. Under no circumstance rescuer properly donning the breathing apparatus himself.

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ENCLOSED SPACE ENTRY PERMIT

TO BE COMPLETED AS APPLICABLE BY OFFICER IN CHARGE OF ENTRY AND APPROVED BY MASTER BEFORE SPACE IS ENTERED

SPACE TO BE ENTERED _____
REASON _____
ENTRY AND EXIT POINTS_____
ATMOSPHERE CHECKED BY _____
READING : OXYGEN _____TOXIC_____IIC_____
NAME OF PERSON ENTERING _____
TIME AND DATE OF ENTRY _____
EXPECTED TIME OF EXIT _____
COMMUNICATION METHOD _____
FREQUENCY _____
LINK MAN OUTSIDE SPACE NAME _____

OFFICER ON BRIDGE DECK INFORMED
TYPE OF VENTILATION IN USE
PERSONAL OXYGEN METER CHECKED
S.C.B.A. READY OUTSIDE SPACE
S.C.B.A. PRESSURE GAUGE READING
RESUSCITATION EQUIPMENT READY & CHECKED
RESCUE LINE, HARNESS AND SAFETY LAMP READY

_____ _____
OFFICER IN CHARGE
MASTER

DATE/TIME: _____

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1.11 **HOT WORK**

1. Defines hot work as any work which generated heat or sparks of sufficiently high temperature or intensity to ignite a flammable gas- air mixture .
2. lists welding, cutting , burning, heating, chipping and use of some power tools generating heat, open flame, electric arc or continuous sparks are some examples of hot work.
3. lists the hot work hazards as fire, explosion, heat injuries, strong light injuries(ultraviolet light affecting eyes) and shock injury to personnel.
4. groups the areas on board where hot work is carried out in ascending order of danger as:

__ engineer's workshop.
__ Engine-room
__ Poop deck and accommodation
__ Cargo area

5. discusses in brief the contents of a hot work permit

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HOT WORK PERMIT

DATE : _____
DESCRIPTION OF WORK :_____

LOCATION _____
DURATION OF PERMIT (MAX. 6 HRS.) FROM _____TO

SAFETY CHECKS

1. Area Cleared of Combustible Material
2. Area And Adjacent Compartment Gas Free/ Inerted
3. No Bunker
4. All Liquid And Vapour Lines Isolated To Area
5. Fire Equipment Made Ready
6. Fire Watchmen Posted And Instructed
7. Communications Establishment Between Fire Watchmen & Bridge
8. Emergency Procedures Discussed
9. Port Approval Obtained (If Required)

SPECIAL PRECAUTIONS

_____

OFFICER IN CHARGE OF SAFETY APPROVED/GRANTED

SIGNATURE_____ MASTER

NAME _____
RANK _____
DATE/TIME_____

1.12 WORKING ALOFT AND OUTBOARD

1. General

1.1 A man working at a height may not be able to give his full attention to the job and at the same time guard himself against falling. Proper precautions should therefore always be taken to ensure personal safety, when work has to be done aloft or when working outboard. It must be remembered that the movement of a ship in a seaway will add to the hazards involved in work of this type. A stage or

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ladder should always be utilized when work is to be done beyond normal reach.
1.2 Seaman under 18 years of age or with less than 12 months experience at sea, should not work aloft unless accompanied by an experienced Seaman or otherwise adequately supervised.
1.3 Safety harness with life line or other arresting devices should be continuously worn when working aloft, outboard or over side. A safety net should be rigged where necessary and appropriate.
1.4 Men should not work over side while the vessel is underway.
1.5 Before work is commenced near the ships whistle, the officer responsible for the job should ensure that power is shut of and warming notices posted on the bridge and in the machinery spaces.
1.6 Before work is commenced on the funnel, the officer responsible should inform the duty engineer to ensure that steps are taken to reduce as far as practicable the emission of steam, harmful gases and fumes.
1.7 Before work is commenced in the vicinity of radio aerials, the officer responsible should inform the radio officer so that no transmissions are made whilst there is risk to the seafarer. A warning notice should be put up in the radio room.
1.8 Where work is to be done near the radio scanner, the officer responsible should inform the officer on watch so that the radar and scanner are isolated, warning notice should be put on the set, until the necessary work has been completed.
1.9 On completion of the work of the type described above, the officer responsible should, where necessary, inform the appropriate officer that the precautions taken are no longer required and that warning notices can be removed.
1.10 Unless it is essential, work should not be done aloft on a stage or platform for cleaning or painting, but can be used as the base for a stable platform.

2. Where men working from a stage are required to raise or lower themselves; great care must be taken to keep movements of the stage small and closely controlled.

3. Boson's Chair

3.1 When used with gantline the chair should be secured to it with double sheet bend and the end seized to the standing part with adequate tail.
3.2 Hooks should not be used to secure boson's chairs unless they are of the type, which because of their special construction cannot be accidentally dislodged.
3.3 On each occasion that a boson's chair is rigged for use, the chair, gantlines and lizards should be thoroughly examined, and a load test applied before a man is hoisted.
3.4 When a chair is to be used for riding toppings lifts or stays, it is essential that the bow of the shackle, and not the pin, ride on the wire. The pin in any case

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should be seized.
3.5When it is necessary to haul seamen aloft in a boson's chair. Only hands should do it; a winch should not be used.
3.6 If a man is required to lower himself boson's chair, he should first frap both parts of the gantline together with a suitable pieces offline secure the chair before making the lowering hitch. The practice of holding on with one hand and making the lowering hitch with the other is dangerous.

4. Rope

4.1 The safety of the man aloft or over side depends upon the strength of the line holding him, whether it is a lifeline to his harness or gantline to a boson's chair or stage.
4.2 Many types of rope of both manmade and natural fiber are available, each with different properties and with different resistances to contamination by substances in use about the ship, which may seriously weaken the rope. Guidance on the selection of manmade fibers can be found in the relevant British Standard. Seafarers should therefore be aware of the general limitations of the different types of rope and the following table is set out as a guide on the resistance of the main rope types to chemical attack. This table is indicative only of the required performance.

1.13 Engine –room watch keeping and Maintenance

1. show the general layout of an engine-room with the help
Of movies, slides or photographs
2. lists the machinery located in the engine-room:
Main engines
Generators or alternators
Boilers
Compressors
Pumps
Motors
3. States that other equipment which may be located in the
Engine-room includes:
Steering gear
Refrigeration machinery
Hydraulic or pneumatic equipment
Two-way portable VHF
Lead-acid batteries
4.state that injuries suffered in the engine-room could be:
Burns through contact with steam pipes, hot surfaces, welding sparks, etc;
Head injuries through overhead obstructions or falling objects
Slips, trips or falls on companion ways, from open floor plates, protruding parts

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Or incautious haste,
Hearing loss through constant exposure to high decibel noise
Contact with moving parts of machinery such as grinder wheels, flywheels,
Propeller shaft

5.State that use of proper protective equipment is absolutely necessary

6.State that accidents can be prevented by good housekeeping and safe working Practices.

7.Gives examples of good housekeeping as:
Oil or water leaks should be immediately attended to
Oil spills should be immediately cleaned and oil-stained lagging replaced
Oily rages or cotton waste should be properly disposed of in a closed container
And not left lying around to ignite spontaneously
Tools should be attended to during work, so that they do not fall of ledges or
Platforms, and be properly collected and stowed after work
Guards for moving parts of machinery should be in position and in good
Condition equipment, stores and parts of opened-up machinery should be
Lashed and secured against movement .
All parts of the engine –room should be adequately lighted

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SAFETY PHILOSOPHY & SAFE WORKING PRACTICES

Most accidents on board ship are caused through carelessness and 80% of all accidents involving ships are reported to be due to human error.

Following is a diagram depicting the quantum of unsafe practices for each fatal injury:

It is your duty as member of the ship's crew to ensure that as possible you maintain clean, orderly and safe places of work and in your living accommodation. While the master will from time to time inspect your cabin & the public spaces, it is up to you to ensure that you keep these areas clean & tidy at all times.

Protective Clothing including safety helmets, safety boots, overalls, wet and cold weather gear must be looked after by you to make sure that such gear is always ready for use. It must be cleaned and dried regularly and stored in a safe place where you can find it in a short notice. Proper clothing especially safety and protective clothing must be ready at all times when at word.

Safety Awareness is the duty of every man on board Make a habit of checking any piece of life saving or firefighting equipment you may pass during your way. If it does not appear to be immediately ready for use, report this to the senior officer.

Work Hazards include tools and equipment left around, cleaning material not properly disposed off, opening and machinery not properly guarded. Always work on basis you may suddenly be called away and do not leave anything which could be dangerous to yourself on return or to another person taking up your job entering or passing your place of work.

All ships will have in place a system of issuing permits prior entering enclosed spaces commencing hot work or performing a job on electrical piece of equipment. This is primarily intended as a checklist to ensure no safety precautions are

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missed out o bypassed.

Some other areas of work will need special attention from you:

Safe gangway: Ensure that the gangway is maintained safe for use of shipboard and shore personnel, is properly lit, free from any obstruction and at correct inclination. The landing platform gangway and approach areas should be maintained non-skid. Correctly rigged safety net a lifebuoy with light and line must be placed. Gangway watches should be continuous for security purposes with efficient means of communication.

In port, ship/shore safety checklist should be filled in after verifying that all safety requirements are met and continued to be so during the entire stay.

Mooring stations are a critical operation. A significant number of accidents take place during these times due to lack of observance of good seamanship practices. Work must be carried out in orderly manner.

All lifting gears must be checked for any defects prior use and safe working load (SWL) of any piece of equipment must never be exceeded.

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Fatigue is a culprit in the creation of dangerous occurrences or accidents.

Ensure that you and your colleagues are properly rested. Under heavy workloads off – periods should be properly utilized to catch up on your sleep. An exhausted person is not only physically sluggish but his mental faculties also get affected to a great extent, which eventually may put not only that person but his colleagues also in a grave danger. Some ports of the world are affected by some diseases, which must be guarded against. Cold & hot weather precautions should be taken by the use of proper & protective clothing.

Handling chemicals & fumigation of the vessel should be carried out with caution.

Non-skid safety shoes must be worn and all working areas kept free of oil.

All applicable signs & notices must be placed in a night place to caution anyone before a dangerous occurrence takes place.

While lifting a load proper lifting position must be adopted & excess weight avoided. Ensure proper hold especially if the vessel is moving in a seaway.

Do not hesitate to requisition assistance if required.

Before entering the refrigerator room's emergency alarms & escape procedures should be checked. If you smell a gas do not enter.

Power tools must have guards in place & the work must be done with full concentration & properly dressed.

All dangerous occurrences, hazardous condition & accidents must be reported faithfully to any recurrences in the future. Feedback from the ship's crew be encouraged and all concerning aspects should be discussed in safety Committee Meetings. These meetings in a vital link in the personal safety for everyone on board & are held regular intervals.

Read and follow all safety related Mariner notices which will surely help in creating safety awareness.

Safety on board is teamwork & every member of this team is required to be discharging his duties in an efficient & professional manner because the chain is as strong as the weakest link in it.

Correct Use of Personal Safety Equipment

Personal protective equipment does not reduce the hazard of injury but only afford some protection is to eliminate the potential hazardous condition on board. Defective or ineffective equipment provide no defense. It is therefore essential that the correct equipment is used & should be properly stored in designated places. Must check the equipment each time before use.

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Personal safety equipment includes: safety helmets, ear protectors, safety goggles, facial shields, dust masks, life jacket & lifeboat.

Safety helmets must be worn a chinstrap so that it does not fall while working at a height & create an additional safety hazards. Also if one of your hands is occupied keeping the helmet in place, the task it becomes unsafe. The helmet must be strong enough to absorb a reasonable. Which can be expected on board ship & should have a harness for supporting the wearer's head? Ear protectors must be worn in the engine room, pump room & other machinery spaces & while chipping with power tools to guard against high noise levels.

Dark goggles are to be used while welding to ward off infra red/ultraviolet rays, which can be disabling for the eyes. Transparent goggles should be worn when there is danger of exposure of foreign bodies such as chipping, hammering, painting, anchoring, grinding & handling chemicals etc. Dusk mask are used to keep away poisonous or dangerous gases. They do not provide protection against toxic gases or oxygen deficient atmosphere which may be encountered Resuscitators containing oxygen for medical use & should not be carried to or near the place of fire to avoid danger of explosion. Before using AB sets, complete checks are to be carried out for detection of any leaks, proper fitting of mask, functioning of warning whistle & pressure gauge.

Leather gloves provide protection against rough or sharp objects such as handling wires. Heat resisting gloves when handling hot objects & rubber gloves in case of acids & chemicals should be used. Non-skid type safety boots must be worn at all times while working on deck or in machinery spaces to guard against slips & crush injuries. United laces create a tripping hazard. While working aloft, safety belt or harness properly secured by a lifeline should be used & in addition. Life jacket or work vest when working over side i.e. while rigging gangway or painting draught marks. A lifebuoy with sufficient line must be kept handy near the place of work.

Aprons & body suits are useful while handling chemicals or acids, which are corrosive by nature. Overalls should preferably have full sleeves & not be loose fitting to avoid being caught in running machinery & sharp edges.

PERSONAL PROTECTION ALWAYS

Wear a SAFETY HELMET on deck & cargo ballast & in cargo ballast & void spaces.

Wear SAFETY SHOES whilst working. Wear "flip-flops" on training shoes on deck.

Use SAFETY GOGGLES when grinding, chipping etc.

Wear GLOVES during mooring operation.

Use EAR DEFENDERS in high noise areas, machinery spaces, pump rooms etc.

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Use SAFETY HARNESS when working aloft or over side.

Wear a BOILER SUIT \ COVERALLS when working in machinery spaces, pump rooms or on deck.

THINK SAFETY

MSS Marine Safety Services

PSA SAFETY CAMPAIGN ON PILOT TRANSFER ARRANGEMENTS

The shipmaster is required to take immediate action of fault\s. If no action is taken, pilot may refuse his service

CONDITIONS

DATE---------- EMBARKING----------

SHIP'S NAME---------- HEIGHT 9M OR LESS----------

CALL SIGN---------- PILOT LADDER----------

FLAG\GRT---------- COMPLINACE----------

MASTER'S NAME---------- REMARKS----------

PILOTS'S NAME---------- ----------

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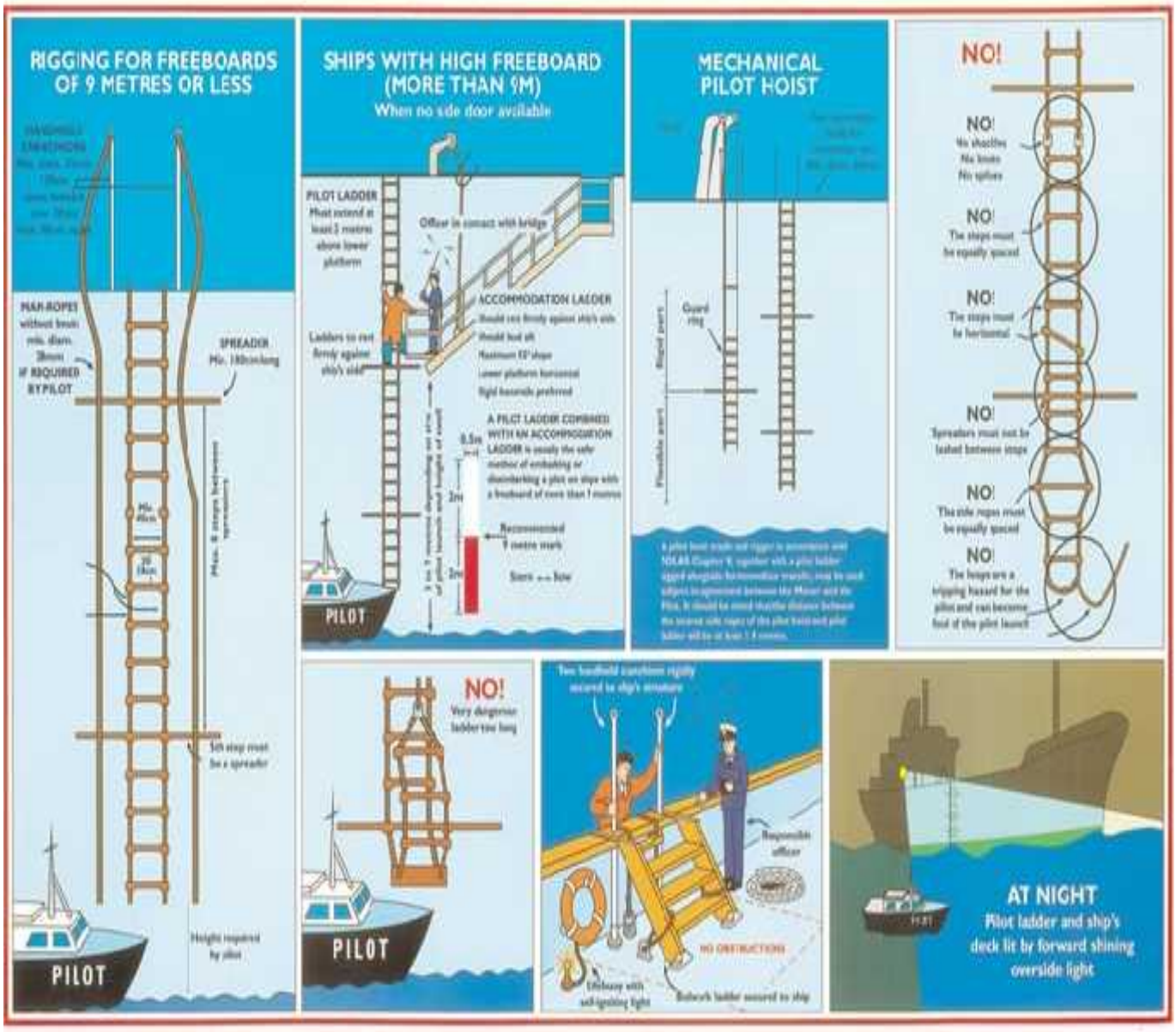

ELECTRICAL ISOLATION CERTIFICATE

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TO BE FILLED WHENEVER ANY PERSON OTHER THAN ELECTRICIAN IS GOING

TO WORK ON ANY EQUIPMENT WHERE THERE COULD BE A HAZARD OF ELECTRIC SHOCK, IF THE ELECTRICAL PART IS NOT ISOLATED.

THIS PERMIT IS VALID FROM _____
(DATE & TIME)

THIS PERMIT IS VALID UPTO _____
(DATE & TIME)

EQUIPMENT ON WHICH WORK IS TO BE DONE:
_____

WORK IS TO BE DONE BY:
_____

WORK IS TO BE DONE BY:
_____

SUPPLY ISOLATED BY ELECTRICIAN AT:
_____

WORK COMPLETED AND CLEARED BY:
_____

(NAME OF PERSON REPORTING WORK COMPLETION)
_____

SUPPLY RECONNECTED BY ELECTRICIAN AT:
_____

_____
RESPONSIBLE OFFICER\

ELECTRICIAN

NOTE: PERMIT SHOULD BE FILLED & GIVEN TO PERSON DOING THE JOB WHO MUST RETURN TO THE RESPONSIBLE OFFICER AFTER COMPLETION OF THE WORK.

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INTERPERSONAL RELATIONSHIPS

General aspects of human relationships:

Human relationships have existed since early (primitive) man began to congregate in groups. Initially for reasons of self preservation from attack by animals or other humans but subsequently by of a desire for social reasons, such as food gathering, companionship, etc.

The formation of such groups progressed and developed into a more structured society whose members lived closely together because of a commonality of cultural attitudes and beliefs in social, religious and political aspects and the desire to live and work within a frame work of “rule of law”.

The social system that have developed in the course of history may differ considerably, depending on culture and environment, But are now generally felt to require an organized structure based on a democratic self-governing philosophy which respects human dignity and accepts that human relationships are an important factor that must be taken into account when human beings from groups for living and working together.

Groups of people eventually evolved and developed into nations possessing a unique behavior pattern within their own individual system which derives from their own cultural background, representing an amalgam of beliefs, practices and knowledge, which has accrued over many centuries. Within their own culture, people generally live in reasonable harmony and equilibrium. Changes if they occur would normally take place over long periods of time, and such gradual changes would not present too much difficulty to the people concerned.

However, if changes in culture are abrupt & sudden they will produce a trauma termed “culture shock” which can result in much disharmony & unhappiness among the people involved.

Forming groups of people from different cultural backgrounds who are then expected to live and work in close contact can also produce comparable traumas unless effective preparation has been carried out to prepare the people concerned for their new multi cultural lifestyle.

The industrial revolution, which commenced and developed in the eighteenth and nineteenth centuries in Britain, brought about large changes in the way society lived and worked. People, who had lived for centuries in a largely agricultural environment mainly in small hamlets and villages, began to move to those areas where industry was being developed and obtained employment at higher wages. Towns and cities began to form advances in science and engineering allowed

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industry to develop at an ever-increasing rate. Social changes were immense and brought education and medical & transport facilities to the masses. Laws relating to employment were enacted for the protection of workers and trade unions & employee associations to develop negotiate on the behalf of employees with employers.

The effect of trade unions in generally improving working conditions has been immense and this has led to human dignity becoming a prime consideration in any negotiations.

Each human being is a unique individual and, normally, no two people are exactly alike physically and mentally (discounting multiple births such as twins). The nature of a human being is often considered to be an inborn characteristic. It is dependent to a large extent on biological make-up and inheritance, but also greatly influenced by the environmental and cultural background into which the human being is born and raised to be an adult, which will eventually be tempered by knowledge and experience.

A modern merchant ship, with a multinational crew, presents a situation in which difficulties and problems will arise stemming from the way in which the ship must operate with a group of people from different cultural backgrounds. With a high probability of communication problems involving language being present.

It should be remember that it is a “whole – person” that is employed, not one with certain separate, but desirable, characteristics. When dealing with personal, the whole person must be taken into account and an attempt made to encourage by demonstrating how, by following specified courses and by certain actions; a person’s sense of fulfillment can be increased.

Role can be defined as “a pattern of actions expected of a person in activities involving others”. It reflects as a person’s position in the social system, with its associated rights, obligations, power and responsibilities.

“Role conflict” can be defined as “other having a different perception on expectation of a person’s role, Role conflict is a fairly common problem where large groups live and work in a close proximity.

“Status” can be regarded as the social rank of a person within a group; one represents the recognition, honor and acceptance given to a person by the other members of the group.

Loss of status is a kin to “losing face” and for many people represents a serious event. In order to protect status, many people develop a high sense of responsibility.

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HUMAN RALATIONSHIPS IN A SHIP SOCIETY

Shipping management differs from management in an industry based ashore in a number of ways, some of the more important being:

The shipping company comprises a number of small mobile industrial units (the ship) which may at any particular moment be distributed over a large distances throughout the world, compared to a shore industry, which operates in a fixed location.

When making a voyage, the ship can undergo considerable climatic change, which can adversely affect personnel.

The ship is operation in a hostile environment and has to cope with extreme conditions of weather.

The personnel operating under relatively stable conditions, with personal being located reasonably close to their work and having all facilities and resources of modern society available to them. The shore industry will have appropriate courses.

The personnel industry may have difficulty in recruiting suitable people for a career, at sea, and with the wide use of foreign flag registries and crewing agencies may meet any difficulties in obtaining crews of the proper caliber, qualifications and experience. Maritime education and training facilities are not as readily available as those or other disciplines and may mean that it is necessary for ship's personnel to travel far or to attend residential courses.

THE VITAL PARTS OF A SHIP ORGANIZATION INVOLVE FLOW OF:

Communication

Information

Decision

Advice

The personnel on the ship must be organized to operate the ship effectively & safely, the more important organizations being:

Watches (or shifts) for sea and harbor

Cargo operations

Maintenance of machinery and equipment

Arrival and departure

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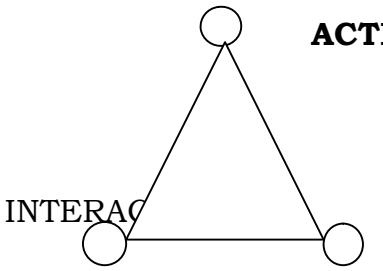
Anchorage

Safety (Fire Patrol, Fire Fighting, Personal Survival)

Communication is of paramount importance in any organization, & this is particularly so aboard ship, where there are so many hazards.

Many problems will arise when a ship has a multinational crew in which there may be a variety of cultures and languages; however, in most cases a common sense approach, with free discussion of any controversial issues, will usually provide a solution.

HUMAN RELATIONSHIPS & BEHAVIOUR



TEAM BUILDING

A team is a set of individuals who work together to achieve a common goal.

Many activities cannot be carried out and many problems cannot be solved on an individual basis or in a two-person relationship. Hence the need for effective teamwork.

In order to achieve maximum efficiency, teamwork and team spirit is required.

The most significant factor in term building is a sense of group identity, a feeling of social support and cohesion that comes with increased worker interaction.

THE CHARACTERISTIC OF EFFECTIVE TEAMWORK

The atmosphere tends to be informal, comfortable and relaxed.

Lot of discussion is generated, virtually everyone participants in the same, but the discussions remain pertinent to the task of the group.

The task or the objective is well understood and accepted by the members.

There is no 'tyranny of the minority'.

Decisions are reached by a kind of consensus in which it is clear that everybody is in general agreement and willing to go along.

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Criticism is frequent, frank and relatively comfortable.

When action is taken, clear assignments are made and accepted.

The issue is not 'who' controls, but 'how' to get the job done.

SYMPTOMS OF BAD TEAM WORK:

There is a feeling of frustration.

Unhealthy competition – trying to run others down.

Unhappy expressions on the faces of the members.

Going to enormous lengths to avoid telling truth.

Meeting involve the participation of only one or a few people, or where managers use the occasion as an opportunity to lay down rules rather than utilize the resources of the team.

TEAM MEMBER – DESIRED QUALITIES

The qualities of a good team member may be listed as follows:

1. Good judgment: Common sense, rationality, logic & positive attitude.
2. Ability to plan and organize.
3. Responsible.
4. Calm but alert.
5. Dedicated, honest and loyal.
6. Ability to direct and control.
7. Good in communication
8. Co-operative.
9. Good interpersonal relationships and teamwork.
10. Good Technical \ Professional knowledge \ Competence.

HOW TO DEVELOP GOOD RELATIONS WITH YOUR COLLEAGUES:

1. Practice courtesy at all times.
2. Be a positive influence to your peers.
3. Respect people for what they are.
4. Co-operate and offer a helping hand.
5. Avoid behavior that is destructive to good interpersonal relationships.
6. Give recognition and emotional support.
7. Be diplomatic.
8. Respect group standards and expectations.
9. Don't take undue credit.
10. Avoid unholy alliances or coalition.

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11. Express interest in your colleagues.
12. Focus on the positive.

WHAT DO PEOPLE VALUE:

Family
Friendship & Relationship
Relationship with God

Work \ Career

Financial and Material Success
Learning and Personal Growth
Appreciation

ATTITUDES:

If we decide to have negative attitudes, then we are responsible for the results of our attitudes. If we decide to have positive & supportive attitudes towards ourselves, our work & our jobs, then we are in the position to enjoy the rewards of such attitudes.

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COMMUNICATION

STCW'95 requires that all persons assigned to shipboard duties shall be able to communicate with other persons onboard on elementary safety matters and understand safety information symbols and signs etc.

STCW'95 CODE- B VI/1 Para 6' says administration should bear in mind the significance of communication and language skills in maintaining safety of life and property at sea and preventing marine pollution. Given the international character, of the Maritime industry, the reliance on voice communication from ship and ship to shore, the increasing use of multinational crew and the concern that the crew members should be able to communicate with the passenger in an emergency, adoption of a common language for maritime communication would promote safe practice by reducing the risk of human error in communicating essential information.

Although not universal by practice English is readily becoming the standard language of communication in maritime industry.

"Administration should consider the benefits of ensuring that seafarers have an ability to use at least an elementary English vocabulary, with an emphasis on nautical terms and situations."

Considering the above, all seafarers, especially, those who cannot understand & communicate in English, are encouraged to learn English at least to the extent to fulfill above requirements.

Good communication means understanding the language as well as the body language. The perception of the sender & receiver should be the same with positive verification that the communication is well understood & that it will be carried out exactly in the manner it was intended to.

An important contribution to effective communication between the shipping company and its personnel aboard ship is through face-to- face contact, when issues of importance to either party can be raised and discussed. In most cases this will take place when a company representative visits the ship while it is in port, and such meeting tend to be short and very informal rather than formal.

When and ship is in post, and probably working cargo, there may be difficulties in getting all personnel together at one time for a meeting. Some personnel may be absent from the ship on leave or for other reasons.

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COMMUNICATION: Process & Skill

Purpose of 'Communication': The word ' Communication' has been derived from a Latin word ' Communications' which means 'to make common'. Hence, communication is used for:
Exchanging information
Passing on instruction
Expression of feelings
Motivating self and others
Solving problems decision making
Understanding attitudes etc.

Process of communication:
A message is both transmitted and received in communication. Therefore the four main elements in this process of communication are:

The sender
The received
The massage
The channel of communication

CHANNEL OF COMMUNICATION

SENDER **REVEIVER**

FEEDBACK

The message (coded0 is transmitted by the sender, through a channel of communication, which can communication can vary. It can be letter, memo, phone call, meeting, interview etc.

The transmitted message is receive by the receiver, who interprets (decodes) the massage and understands it. The receiver can then responds to the message again through verbal or non-verbal channel of communication, and this response is termed as 'feedback'

The process of communication is dynamic wherein the sender and receiver can interchange their roles and there is flexibility in the choice of the channel of communication.

The feedback can be a measure for the sender to understands whether the message is interpreted in the desired way. Interpretation can vary due to difference

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in understanding of words, based on past experiences, beliefs and varying perceptions.

Effective communication aims at not only transmitting messages but also understanding the interpretation of the message by welcoming feedback. Communication becomes a two way process when there is an exchange between the sender and the receiver.

In order to aim at effective communication. The sender who initiates the messages must answer these questions:

Who ?Who is the person I want to communicate to? What kind of person he/she is. Does he/ she know enough of the subject to act upon my messages.
What? What am I trying to say ?
What background information should I pass on? What should I leave out?
What is the best medium to use?
Why? Why do I want to communicate this message?
Why is it important?
Why should/she receive the information?
When? When should I communicate this message?
When will he/she be ready for this message?
How? How should I communicate this message?
How can I be sure he/she will understand or listen?

CHANNELS OF COMMUNICATION:

The different channels of communication can be verbal, non-verbal & symbols.

The sender transmits	The receiver gets the
Message through	message through
Talking	Listening
Writing	Reading
Body language/symbols	seeing

VERBAL COMMUNICATION:

In this of communication. There is usage of words in the form of languages. This can be transmitted through spoken on written printed form.

TALKING-A SKILL

Words and language is used to communicate our ideas, feelings, thoughts etc. The sender should make use of appropriate words for communication keeping in mind that it is the receiver who gives meaning to the words (as per his/her interpretation of the message).

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The tone in which the message is communicated also contributes in giving meaning to the words. The tone can be soft , harsh, bitter etc. hence a sender has to be aware of his/her tone which communication. Tone Expresses feelings. Incongruence between the word and tone can lead to miscommunication.

Hence it is said that in communication, it is not only important ' what you say', but also ' how you say it'.

LISTENING –A SKILL

Listening is the process of 'hearing' the other person. This involves not only noting the things that they say, but also whole range of other aspects of communication. The other aspects denote the volume of speech, tone, body language etc. that express feelings. Hence it is said that an effective listener is with his ears, eyes and heart.

Listening is a skill hence it is said that one has to learn 'How to listen so that others can talk'.

NON-VERBAL COMMUNICATION:

Non-verbal aspects of communication refer to 'body language', the way a person expresses himself/herself through the use of his body. In other words, non-verbal communication refers to all external stimuli other than spoken on written words, Non-verbal body language includes body motion, characteristics of appearance, characteristics of voice and use of space and distancing. In day-to-day oral communication, we on interpreting Non-verbal clues without being aware that we doing so. It is only recently that a systematic study has made to analyses Non-verbal communication.

The Non- Verbal aspects of body language are:

Personal appearance:

The first impact on the audience/ listener is created by the personal appearance of the speaker. Even before the speaker utters the first syllable, the audience/ listener begins to form an opinion about the speaker and visualize the way he/ she is going to talk.

Posture:

The way a person is sitting, standing, walking etc. gives meaning or denotes the person's state of mind like enthusiasm, confidence, uncertainly, hostility, eagerness etc. It also reveals an individual personality.

Facial expression:

Laughter, raised eyebrows, eye movements, twitching nose etc. expresses a rage of feelings. It is said that facial expression can denote surprise, fear, anger, sadness,

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happiness , enthusiasm and disgust.

Gestures (Body movement):
Gestures play a significant part in marking communication effective. A well timed gesture can drive a point home. Oral communication is accompanied by gestures. Open and free gestures denotes the comfort of the speaker. Gestures add value to what is being said. However, gestures need not always be accompanied by oral communication. Gestures on their own are used to communicate certain elementary & short messages such as 'no', 'come here'. 'go there', 'keep sitting', etc.

Touch:
Touch provides intensity to the communication. Touch also reveals the closeness in a relationship. Where words fail, touch plays an important role in communicating. E.g. embracing, handshake, patting on the back etc.

Eye contact:
Eye contact helps a speaker to obtain the attention of the audience /listener also gather non-verbal feedback of the audience/ listeners. Eye contact also shows the comfort ability of a communicator with the other person.

By observing or seeing the body language, one can receive messages. But again, 'Seeing', and 'understanding' are not synonymous. By seeing the same body movements , two different receivers can interpret & understand them differently as per their respective perceptions.

FEAR OF UNKNOWN

People don't get along:- because they fear each other
They fear each other:- because they don't know each other
They don't know each other each Each other because they have not properly communicated with

(Martin Luther King)

Positive/Negative thoughts Actions Expression/Gesture

Positive	Negative
Enthusiastic	Angry
Respectful	Lazy
Harmonious	Critical
Tolerant	Careless
Honest	Egoistical

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Happy	Stressful
Understanding	Greedy
Patient	Dishonest

Negative thoughts and action always Leeds breakdown of physical health and eventual eternal failure.

BARRIERS TO EFFECTIVE COMMUNICATION

External : Noise/ Disturbance/ Distractions/ Ambience Time constraints- of self & of others.

Internal: Inadequate knowledge, Poor self-image, Frame of mind, Attitudes, Biases/ prejudices, Stereotyping, Mind set/ frame of reference. Inappropriate verbal/ or non-verbal language, Non-listening, Non-use of appropriate/relevant audio-visuals.

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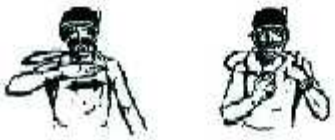
Code of Hand Signals

	Meaning/Signal	Comment
	STOP Clenched fist	
	SOMETHING IS WRONG Hand flat, fingers together, palm out, thumb down then hand rocking back and forth on axis of forearm.	This is the opposite of Okay, the signal does not indicate an emergency.
	I AM OKAY OR ARE YOU OKAY? Thumb and forefinger making a circle with three remaining fingers extended (if possible).	Divers wearing mittens may not be able to extend three remaining fingers distinctly. Short range use.
	OKAY ON THE SURFACE (CLOSE) Right hand raised overhead giving Okay signal with fingers. **OKAY ON THE SURFACE (DISTANT)** Both hands touching overhead with both arms bent at 45° angle.	Given when diver is close to pickup boat. Given when diver is at a distance from the pickup boat.
	DISTESS OR HELP OR PICK ME UP Hand waving overhead (diver may also thrash hand in water).	Indicates immediate aid is required.
	WHAT TIME? OR WHAT DEPTH? Diver points to either watch or depth gauge	When indicating time, this signal is commonly used for bottom time remaining
	GO DOWN OR GOING DOWN Two fingers up, two fingers and thumb against palm.	
	GO UP OR GOING UP Four fingers pointing up, thumb against palm.	
	**I'M OUT OF AIR.** Hand slashing or chopping at throat. **I NEED TO BUDDY BREATHE** Fingers pointing to mouth or regulator.	Indicates signaler is out of air. Singnaler's regulator may be in or out of mouth.

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EMERGENCY PROCEDURES

Emergencies can arise at any time & most unexpectedly so the ships personnel have to be extra alert & vigilant to tackle with any odd situation in the most professional way & overcome the problem in the shortest time frame as the safety of ship & life on board the depends on such action. Though we all know that the emergencies are not routine, but appreciating the stakes involved, it is better that we keep our lifetime.

The first principle to deal with any emergency is to keep cool& use your commonsense. This can only be possible if the standard if training is appreciably higher. This is because the right action must strike you without straining yourself to think for which you do not have time. This is achieved by repeatedly exercising in all environment, which can reasonably expected during such incident. There is saying “more you sweat in peace, less you bleed in war.” These drills must be a possible & never to be taken as a repeatedly. This lacuna we have to guard ourselves against. In off periods even though the weather may be good, simulate the worst condition of heavy weather, no lights, off hours & a few resources & then try to perfume correctly. It must be kept in mind that all emergencies will result in a certain of shock in the persons involved.

Since in an emergency proper conduct of all is viral. You not only remain responsible for your safety, but also in your right actions lie the survival of your shipmate & ship. Crisis management is teamwork & every member of the team must carry out his designated work because the chain is a strong as weakest link in it. Some of the emergency situations, where the risk of life & property is feared on board ships are dealt here with.

TYPES OF EMERGENCY

1. Collision
2. Fire
3. Foundering/ Flooding /Beaching
4. Main Engine Failure
5. Steering Failure
6. Oil Spill
7. Gas Leak
8. Piracy
9. Man Over Board
10. Shifting of cargo

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EMERGENCIES

Collision / Imminent Collision: There are sets of rule to guide you of taking actions if a risk of collision exists between ships or other marine crafts. These rules called COLREGS are mandatory & must be followed while navigating except in the most exceptional cases if there are valid reasons for you for not following these rules. These rules must be fully understood by the navigating officers to enable to take action because the lives on board depends entirely on your action.

Action on Discovering Potential Emergencies:

Collision / Imminent Collision:-
Sound general alarm.
Inform master as soon as possible (in all emergency).
Anchor, if feasible. If collision unavoidable reduce impact.
Shut all weather tight doors and switch on lights.
Muster crew and count heads.
Send out urgency/ distress message (if required).
Sound all spaces.
Check for fire and damages.
Prepare lifeboats for launching.
Exchange identities with other vessel i.e. name, last post, next port of call.
Port of registry.
Standby to render any assistance to the other vessel. If is a duty to render.

Fire: One of the most common accidents on board is fire. The sequence of actions to be taken to deal with fire is denoted by the letters itself as given below:

F - FIND

I - INFORM

R - RESTRICT

E - EXTINGUISH

Heat/ oxygen/ fuel forms, the three sides of a fire triangle & if any of these three components can be eliminated, the fire will die. This is achieved by:
Cooling with water
Smothering with steams or CO_2 to cut off oxygen
Starving the fire by removing or restricting fuel supply.

Fire (Action)

Sound alarm and announce location of fire.
Stop ventilation to the affected spaces.
Muster crew and count heads.

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Send out urgency/ distress message as directed by master.
Keep survival craft in readiness for launching.
Contact coast station/ owners etc.
Arrange & prepare for receiving assistance from other ships/ coast stations.
The hazards of fire on board & the action to be taken to avoid fire must be well understood. Some of the precautions to avoid fire on board are given below:
Follow the smoking regulations.
Do not smoke in open area, alleyways, toilets, & other prohibited spaces & certainly not bed.
When ashore do not smoke in the port area if prohibited.
On tanker, the smoking areas are marked & they will have at least two doors separation from outside to avoid inflammable gases entering in these spaces.
Never use lighters on board because these may create spark if dropped by chance from your pocket on the deck.
Always use approved safety torches.
Do not use unauthorized electrical appliances in your cabin. Make sure connection & loose wiring must be avoided at all times. Use of radio or other electrical gadgets on tanker deck is strictly prohibited. Use only the inbuilt aerial connections for radio T.V. etc.
The very important of avoiding a fire hazard are to keep your ship near & clean at all times. Some of the material, if left to lie, will catch fire, which is termed as spontaneous combustion.
Never use dustbin as ashtrays.
Never drag any metallic item on the deck. The friction between the deck & item may cause spark & will lead to fire.
While carrying out maintenance, use non-sparking tools for chipping & hammering jobs.
On board tankers one of the major fire hazards is static electricity. There are many causes & circumstances of static electricity. You are advised to be familiar with safe tanker practices & work under the guidance from your senior offices.
Never hesitate to ask if in doubt & never cut corners & compromise on safety.
Always use intrinsically safe equipment duly approved.
Take all necessary precaution against fire before doing hot work. Uses a check lists so that nothing is missed out mostly all ships have a permit system for hot work, sample of which is shown for reference. Welding & gas cutting equipment must always be maintained in good shape.
When carrying dry cargo, consult material safety data sheets for the cargo being carried & take appropriate precautions for fire & toxicity. Coal is likely to emit methane, which is inflammable. Using surface ventilation under the supervision of your senior must disperse these gases.

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FOUNDERING (SINKING): The causes of this may be grounding, heavy weather, lack of stability, collision, shift of cargo etc. All necessary precautions must be taken to avoid a calamity of magnitude well in time. If the ship has to be abandoned., the master gives the order verbally.

Foundering :

Confirm flooding (after collision/ grounding etc.)
Start pumps to pump out water.
Check extent of damage and contain if possible
Send out urgency/ distress message.
Prepare survival craft.

Main Engine failure:

Display N.U.C. (Not under Command) Lights/ shapes.
Change to hand steering and switch on both steering motors.
Broadcast nature of emergencies to all ships in vicinity & coast station.
Prepare for anchoring if in anchoring depth.
Prepare all means of communication & have them ready for immediate use.
Check effect of likely roll heavy weather on cargo.

Steering Failure:

Switch to hand steering or NFU mode.
If no response, rush to emergency steering in the steering compartment.
Slow down engines and stop.
If in danger of collision/ grounding- give emergency stop on main engines.
Exhibit NUC lights or shape.
Broadcast warning to ships in vicinity and coast station.
Prepare for anchoring if feasible.
Check effects of likely roll on cargo.

Oil Spill:

Raise alarm
Stop all cargo operation & depressurize lines by opening appropriate valves.
Arrest leaks as soon as possible. Make all efforts to contain oil inside vessel.
Inform local authorities at once if any oil escapes over board.
Prepare main engine for evacuation of the berth if in port.
Put oil spill contingency plan in action.
Clean docks using SOPER GEAR.
Local authorities have granted use Oil Spill Dispersants (OSD) only after permission.
Minimize pollution and protect environment.
Treat the emergency at par with fire.

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Piracy

Sounds general emergency alarm.
Increase speed and alter course to seaward.
Switch on all lights and dazzle attackers with searchlights.
Fire warning rockets and operate hoses to repel pirates.
Alert shore authorities and ships in the vicinity.
If boarding succeeds, crew to retreat safe locations.
Offer no resistance, stay calm and do not be heroic.
Broadcast urgency / distress message.
Inform international marine bureau (IMB).

Man overboard

If the man is in sight take a round turn.
If out of sight take Williamson turn.
Sound general alarm
Put engines on standby for man oeuvre.
Post lookouts preferably at high locations with all around visibility.
Broadcast urgency message.
Prepare rescue boat and have first aid squad ready.
Pick up survivor on windward side to avoid vessel drifting over the casualty.
Prepare for medical evacuation if serious.

Assistance to anyone in danger or being lost at sea

Inform coast station / owners / chartered.
Maintain accurate records (important in all emergencies).

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SHIPBOARD CONTINGENCY PLANS FOR RESPONSE TO EMERGENCY

A Typical shipboard Response to an Emergency

COMMAND CENTER
MASTER – OVERALL INCHARGE
03rd OFFICER-ASST.
O.S / AB-STEERING DUTY
ERR-MESSENGER

SQUAD 1

Ch Officer – LEADER
04TH ENGR-DEPUTY
AB
AB
OS
SALOON RATING

SQUAD 2

02ND ENGR-LEADER
O2ND OFFICER-DUPUTY
AB
OS
SALOON RATING

SQUAD 3

TECH. TEAM
CHIEF ENGR-LEADER
03RD ENG-DEPUTY
ELECTRICAL OFFICER
ERR
MESSENGE-OS /AB

SQUAD 4

SUPPORT TEAM
CATERING OFFICER-LEADER
BOSUN-DEPUTY
OS / AB

SQUAD 1

This squad generally musters at the Emergency Headquarters, which, is marked as EHQ on hearing the emergency alarm. Squad 1 on receipt of the nature & location of the emergency gears up for combating the emergency. For e.g. if the nature is fore in accommodation then the member of squad 1 wear Compressed Air Breathing Apparatus (CABA), carry fire hoses.

SQUAD 2

This squad is the support squad, which assists Squad 1. The members of squad 2 generally muster on the poop deck and gets additional hoses ready for boundary cooling (a process of cooling the bulkheads from the exterior – outside). The 3rd Officer who is generally In-charge of this squad takes 1 seaman & lowers one of the

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lifeboats, if required by Squad 1.

SQUAD 3

This squad consists of Chief Engineer Officer & electrical Officer. These members mainly carry out duties of isolation of power supply; taking over the emergency generator in case does not start automatically on blackout condition & general overview of technical aspect of fire fighting.

SUPPORT TEAM

This group consists of Ch. Cook, 2nd cook & Steward. Chief Cook is the in charge of the stretcher team & first aid. Assistant will keep provisions & blankets etc. ready Boson is the deputy team. He mainly required when abandon is called.

SHIP BOARD CONTINGENCY PLANS

These plans aim to assist personnel effectively dealing with emergency. Their primary purpose is to set in motion the necessary actions to stop or minimize damage & to ensure that the action taken is structured, logical & timely manner. These plans must be:

Realistic, practical and easy to use.

Understood by both personnel ashore and on board.

Evaluated, revised and updated regularly.

In the absence of the plan

In the heat of moment lack of planning will result confusion. Mistake & failure. To advise key people.

Delays will be incurred & time will be wasted, leading to worsening or the situation.

As a result, the ship & crew may be exposed to increasing hazard & damage.

The contingency plan should identify different types of emergency, which may arise on a particular ship and may include:

Allocation of duties and responsibilities.
Actions to be taken to regain of a situation.
Communication methods within and outside ship.
Procedures for requesting assistance.
Procedure for notification.
Procedures for dealing with media / ashore authority.

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Procedure for dealing with emergency should, as far as possible, are consistent in a fleet. The most effective organization for dealing with emergency situations should be adopted. A casualty procedure is formulated by management in office to provide proper backup system for ship in distress. Such procedures should be tested from time to time during emergency drills. Proper procedures should be published and following for outside assistance such as salvaging.
Potential emergency situations likely to be found in a ship should be analyzed drills. The company's safety manual contains of contingency planning, emergency organization and other safety advice specific to company's fleet complimentary to that, available in other publications.

Important helpful technical guidance in the form of checklist have been issued by various industrial organization such as the international chamber of Shipping, the oil companies International marine forum and the International association of independent tanker owners.

EMERGENCY SIGNALS

These may differ from ship to ship. Your foremost duty is to know them as soon as you join the ship. Generally the signals will be:

General emergency / Alarm

Seven or more short blast followed by one long blast on ship whistle called General Emergency Alarm.

Action: - Proceed immediately to emergency muster station. Take your life jacket with you.

Note: **Order to Abandon Ship will be by Master Verbally**

Other Alarm: These apply to specific crewmembers & must be well understood.

DISTRESS SIGNALS

The following signals used or exhibited together or separately indicate distress and need of assistance:

a) A signal sent by radiotelephony consisting of the spoken word "May Day"
b) A rocket parachute flare or a hand-flare showing a red light.
c) A smoke signal giving off orange color smoke.
d) A gun explosive signal fired at an interval of about a minute.
e) A continuous sounding with any fog – signaling apparatus.
f) Rockets or shells throwing red stars fired one at a time at short intervals.
g) Slowly & repeatedly raising & lowering arm outstretched to each other.

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h) The Radiotelephone alarm signal.
i) Signals transmitted by emergency positioning indicating Radio beacons. (EPIRB)
Attention is drawn to the relevant sections of the international Radio Beacons.

VALUE OF TRAINING & DRILLS

The purpose of training & drill is to ensure that crewmembers gain confidence in controlling situation that is likely to arise in emergency. They should aim to cover all likely emergency situations. Refresher courses & "on the job" familiarization training form a part of such exercise. The drill should mobilize the shore based management emergency contingency plans.

On joining the vessel familiarize yourself immediately with the location & operation of life saving & fire fighting appliances nearest to your cabin & read company's safety & training manual at your earliest check escape route from your cabin & workplace to the lifeboat station & emergency muster station.
Know your muster station & emergency duties. Have your officer in charge explain if you do not understand check your lifejacket & find nearest location of fire alarm to your cabin. Through knowledge of the correct operation of all equipment is your priority, nevertheless in emergency, if you are in doubt about the correct operation of LSA/FFA equipment, does not panic, as the instructions will be printed on them in a clear & concise manner.
It is a requirement to hold at least one fire & abandon ship drill every month on cargo & every week on passenger vessels. Drill must b held within 24 hrs, of sailing if more than 25% of crew is changed at the last port. On most ships for better training every lifeboat is required to be launched & maneuvered in water at least once in three months. If one of the motor

Lifeboats in designator as the rescue boat, this drill should be utilized check the speed of boat, which should not be less than 6 knots with full compliment.

Correct use of other life saving appliances should be demonstrated to check the speed of boat, which should not later than two weeks after joining & should include :-

Donning of life jacket
Use of lifebuoys and attachments
Donning of thermal protective aide (TPAs) and immersing suits
Launching procedure for life rafts
Launching on the use of rockets, hand flares, smoke signals, and line throwing apparatus (LTAs)

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Their demonstrations are helped concurrently with the weekly drills. They also include survival procedures cause and treatment of hypothermia and aids.

Muster Lists / Muster Station

Specific muster lists are prepared on every ship defining specific duties of each crewmember in clear & concise manner in case of any emergency station. Muster lists must be kept up to date incorporating any charges of crew or equipment on board the vessel. These are posted at conspicuous places on board such as bridge, ECR and one on each deck for easy accessibility. In addition an individual duty roster should be posted in all cabins describing emergency task for each crew. Muster list will specific fire & emergency signals followed on board that Vessel & will include following duties:

Preparation and launching of survival craft.
Closing of watertight doors, scuppers and other openings.
Use of communication equipment.
Stopping vents and closing manual vent affected areas.
Use of fire extinguisher. Fire hoses, fireman's outfit etc, & backup.
Any special instructions.
Muster of passengers (if applicable)

For launching the conventional open life boat, the duties are typically allocated as follows:

Bowman: clear lifeline, check falls, ship plug, if applicable, passes painter forward, check tracing pendant & prepares browsing - in tackle.

Stern Sheet Man: clear lifeline, check falls, ship plug, check Tracing Pennant, prepares browsing, tackle & ship tiller.

Ford Gripes/Pins: Release griper & unships pin to allow davit to be lowered.

Aft Gripes/Pins: Same as above.

Toggle Painter Man: Passes the boat painter from outside the vessel clear of all obstructions & makers fast on main deck bits.

Ladder Man: Lowers boat ladder for embarkation.

Lowerer: Lowers the boat first to the embarkation deck & after Boarding by the crew, to the water level.

Standby: To collect extra water, medicines and blankets etc.

For lifeboats of different designs, that is, enclosed and free type different launching will apply.

KNOWLEDGE OF ESCAPE ROUTES, INTERNAL COMMUNICATION & ALARM SYSTEM

Knowledge of escape routes from your cabin & workplace is of paramount important for the survival of personnel on board. Finding your way out in complete darkness & smoke should be practiced at frequent intervals. Relevant exit 7 arrow sign are additional posted to guide you to safety.

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Internal Communication System:-

1. Board Cast (Public Address System)
2. Inter com
3. Exchange Telephone
4. Sound powered Telephone (SPT)
5. Loud Hailer
6. Walkie-Talkie
7. Voice Pipe
8. Telegraph
9. Messenger
10. Alarm System

Communication within the ship is carried out by public address system which is operable from the bridge and also from the individual telephones, voice pipe; telephones are at the bridge, engine room, EHQ, steering compartment, pumps room & other important spaces. Walkies-Talkies provide a vital link in the communication system & are virtually reachable in all spaces within the ship. Battery operated loud hailers are required for main deck. For abandon ship situation 3 Walkies-Talkies for emergency use are required for communication between ship & survival crafts & amongst survival after abandonment.

Emergency alarms are capable of being operated from bridge, EHQ & manually from various strategic locations within the accommodation block & engine room. The system is audible throughout the living quarters, engine room & pump room the fire alarm is also actuated automatically by fire, smoke or heat sensors placed in the engine room & living spaces. On certain ships, they automatically close the fire doors on each deck by releasing the magnetic stoppers. Manual fire alarms are activated by breaking the glass & operating push button, which is also clearly marked in red. The emergency alarm may be supplemented by a public address system to announce the nature of emergency or locating fire.

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POLLUTION PREVENTION

Marine Pollution Prevention:

Introduction of any substance / energy / oil / chemical into the marine environment is called "MARINE POLLUTION", such as SEA WATER: - garbage, plastic, oil, ATMOSPHERE: - chemicals, hydrocarbon, toxicities, gases.

TYPES OF POLLUTION

1. Oil pollution
2. Chemical pollution
3. Garbage pollution
4. Sewage pollution
5. Air pollution
6. Microbiological pollution
7.

While the vessel is in USA, Canada, Australia, U.K. no ballast discharge exchange ballast 200 miles before arrival to port.

Oil Pollution: Major causes: Operational:

a) Accident
b) Overflow
c) Bilges
d) Tank cleaning (Oil Discharge Monitoring control System)

Chemical Pollution:

a) Cargo Tanks (OSD etc.)
b) Accident
c) Operational

Garbage Pollution:

Gally
Oily waste
Solids (Bottles, Tins)
Plastic: Non Biodegradable (Fish Gets Poisoned)

Sewage Pollution

Treatment Plant
Collection Tanks
Collection in Tanks
Arenation Bacteria Created
Chlorinated Tabs

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Air Pollution

Chemical: Dust, Fumes, Gases
Self-Protection
Disposable Type

Effect of Operational and Accidental Pollution:

Operational Pollution of the seas is caused by way of routine matters such as tank cleaning, bilge water discharge etc. the primary air of the international regulations is to minimize the discharge of oil through operational activities. The measures taken in this regard are the introduction of load on top (LOT) procedures, requirement for segregated ballast tanks, demarcation of special sea areas, introduction of heavy penalties and creating general awareness among the seafarers. The results are quite discernible, as the oil discharge in recent years has been brought down appreciably.

The USA has gone a step further by introducing more stringent measures through the oil Pollution Act of 1990 (OPA'90) Limitation of liability to oil tanker companies for the environmental damage caused due to oil discharge, whether operational or accidental has been done away with. The requirement for double hull tankers & mandatory reporting requirements for prompt cleaning operations have been introduced.

The need for strict measures was felt, culminating in OPA'90 after the Exxon Valdez grounding in Alaskan waters. The damage to the sensitive ecology of that area was so extensive that the Exxon Corporation has since spent 10 billion dollars towards the cleanup costs & penalties.

Better training of seafarers and healthier ship will go a long way in minimizing the risk of accidental pollution of the seas, which should be an area of prime concern to all of us.

BASIC ENVIRONMENT PROTECTION PROCEDURES

Very strict regulations now exist on the disposal of virtually all kind of waste. Nothing including waste, or other matter of description should be dumped overboard at any time without the direct permission from the responsible officer who will be guided by the relevant international regulations. All crewmembers must be aware of heavy penalties of such illegal dumping & use the facilities for waste disposal on the vessel. In the event of oil or chemical spillage all crewmembers must be given their best effort to contain the spills on the vessel & prevent the oil or chemicals crewmembers must be give their best efforts to contain the spills on the vessel & prevent the oil or chemical entering the water. All crewmembers must know where the special chemicals & clean up material are

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kept for this type of accident & must be aware of the special precautions necessary in handling these materials.

It is the duty of all on board to report immediately to the duty officer if any sign of oil or other spillage on board.

Annex 1 of MARPOL 73 / 78 regulates the discharge of oil into the sea. No discharge of oil or oily materials from the ship is permitted except when all the following conditions are satisfied.

1. The tanker is not within special area. The special areas are the seas, which due to their ecological and geographical reasons are prone to the risk pollution to great extent than the open sea. The Mediterranean Sea, Baltic Sea, black sea, Arabian Gulf of Aden & Antarctic areas are designated as special area for this purpose.
2. The tanker is more than 50 nautical miles from the nearest land.
3. The tanker is proceeding en route. This means that the vessel should be moving & proceeding on her planned voyage & not just going on circles. The purpose is to avoid high concentration of oil discharge at any place.
4. The instantaneous rate of discharge of does not exceed 30 liters per nautical mile. By this meant that the effluent concentration should be homogenous at times.
5. Total quantity of oil discharged into the sea does not exceed 1/30,000 of the Total Quantity of the particular cargo of which the residue formed a part, Please note that is not as per the total carrying capacity of the ship.
6. The tanker has in operation an Oil Discharge Monitoring & Control System (ODMCS). This equipment measures the concentration & quantity of oil being Discharges & will stop all discharge over board if these parameters are exceeded. A printer record is kept automatically for future reference.

For Cargo Ships, all discharges from machinery space bilges are prohibited unless following conditions are satisfied.

1. The Ship is not within special area.
2. The ship is proceeding enroute.
3. The oil content of effluent not exceed 15 ppm. (Parts per million)
4. The ship has in operation the equipment for this purpose.

If the vessel is not fitted with 15ppm equipment i.e. oil discharge monitoring and control system & oil filtering equipment then the vessel must be more than 12 nautical miles from the nearest land & the oil content of the effluent is less than 100-ppm. This exception was valid till 6th July 1998. Annexes 2 &3 of MARPOL control & regulate the discharges of noxious substances into the sea, which are harmful to marine life.

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Annex 4 deals with discharge of sewage from ships. Under this regulation the discharge of sewage into the sea is prohibited unless the waste is comminuted & disinfected, & the vessel is not less than 4 nautical miles from the nearest land.

Sewage, which is not comminuted & disinfected, must be discharged outside 12 nautical miles from the nearest land. The sewage that has been stored in holding tanks while the vessel was in port must not be discharged instantaneously but at a moderate rate when the ship is en route & proceeding at not operations at not less than 4 knots. The above restrictions do not apply if the vessel has an operational sewage plant & the effluent does not produce visible floating solids or discoloration of water.

Annex 5- Garbage & Garbage Management –

The garbage is to be grouped into categories:-

A. Plastic (Non biogradable)
B. Food wastes
C. Domestic Waste (eg. Paper products, rags, glass, metal, bottles, crockery, etc.)
D. Cooking Oil
E. Incinerator Ashes
F. Operational Wastes
G. Cargo Residues
H. Animal Carcass
I. Fishing Gear

Garbage:- Garbage means all kind of victual, domestic and waste excluding fresh fish & parts thereof, generated during operation of the ship & liable to be dispose off continuous.

<u>Disposal of garbage outside special area-</u>

a. The disposal into the sea of all plastics, including but not limited to synthetic ropes, synthetic fishing nets, plastic garbage bags & incinerator residues, is prohibited.
b. I) 25 nautical miles:- for dunnage, lining & packing materials which will Float.
   II) 12 nautical miles for food waste & all other garbage including paper Products, rags, glass, metal, bottles, crockery & similar refuse.
   III) 3Nm incase such comminuted or ground garbage shall be capable of Passing though a screen with opening no greater that 25mm.

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RECORD OF GARBAGE DISCHARGES

Ship name :_____distinctive No._____IMO No._____

1. Plastic
2. Floating dunnage, lining or packing materials
3. Ground paper, glass, metal, bottles , crockery etc.
4. Paper products, rags, glass, metal, bottles, crockery etc.
5. Food waste
6. Incinerator ash. Except from plastic.

Note:- The discharge of any garbage other than food waste is prohibited in special areas, only garbage discharge discharged into the sea must be categorized, garbage other than CAT
1 discharged to reception facilities need only be listed as a Total Estimated Amount.

Date/Time	Positon of the ship	Estimate amount discharged into sea(M3)	Est.amount discharged to reception facilities to other ship	Estimated amount incinerate (m3)	Certificate Signature

Master's Signature _____dated _____

To maintain better prevention of all pollution, garbage must be separated in the beginning itself. All food waste should be comminuted before throwing overboard in permitted areas. All garbage must be categorized in different storage drums, which should be covered, & leak proof. These drums may be colour differently & marked clearly to hold different categories of garbage for easy identification. Garbage disposal log of which a sample copy is enclosed, should be updated with accurate entries on daily basis. If the vessel has an incinerator on burn to burn the waste it must be put to maximum use. All efforts must be made to retain garbage on board till an opportunity arises for shore disposal.

Pollution of the sea having reached alarming proportions the international regulations is becoming increasingly stringent. To avoid heavy fines & delays it should be our utmost duty to keep seas clean & prevent destruction of marine life.

Regulations covering the various sources of ship-generated pollution are contained

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in the five annexes of the Convention.

ANNEX I – Regulation for the Prevention of Pollution by Oil. Annex 1 entered into the force on 2nd October 1983 & , as between the parties to MARPOL 73/78, supersedes the International Convention for the Prevention of Pollution's of the Sea by oil, 1954, as amended in 1969, which then in farce.

ANNEX II- Regulation for the Prevention of Pollution by Noxious Liquid Substances

Annex II entered into force on 6th April in 1987 in a form amended by the MEPC by resolution MEPC 17 of 5th December 1985.

To maintain better prevention of all pollution, garbage must be separated in the beginning itself. All food waste should be comminuted before throwing overboard in permitted areas. All garbage must be categorized in different storage drums, which should be covered, &leak proof. These drums may be colour differently & marked clearly to hold different categories of garbage for easy identification. Garbage disposal log of which a sample copy is enclosed, should be updated with accurate entries on daily basis. If the vessel has an incinerator on burn to burn the waste it must be put to maximum use. All efforts must be made to retain garbage on board till an opportunity arises for shore disposal.

Pollution of the sea having reached alarming proportions the international regulations is becoming increasingly stringent. To avoid heavy fines & delays it should be our utmost duty to keep seas clean & prevent destruction of marine life.

Regulations covering the various sources of ship-generated pollution are contained in the five annexes of the Convention.

SHIPBOARD SPILL MITIGATION PROCEDURES

Shipboard Spill Mitigating Procedures shipboard clean up equipment shall be readily available on the Main Desk. The Chief Officer is responsible for the maintenance & storage of this equipment . Crewmembers will assist in containment & clean up as directed by the Chief Officer.

The Appendix contain crew responsibilities & procedures for mitigating oil discharges. Appendix B identifies the location on-board of equipment to mitigate an oil discharge. Ships and vessels are supplied with Oil Spill Equipment as follows:

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Position 1 : Main deck, close to cargo and bunkering areas.
EQUIPMENT: 6 Bags of Absorbent Material
2 Rubber Buckets
2 Shovels, and/or Scoops
2 Empty Drums
Position 2
LOCATION: Main deck, forward of the Accommodation Block.

EQUIPMENT : 6 Bags of Absorbent Material
2 Rubber Buckets
2 Shovel, and /or Scoops
2-200 liter Empty drums
Oil Pollution Absorbent Pads
600 liters of Oil Spill Degreaser/Detergent
2 Air Portable Pump
1 Set Protective

The oil Spill equipment has to be mobilized to the proper location before starting of cargo / bunker operation.

The portable pumps must be tested before the operations & connected to the driving source.

Radio officer : secretary to master

Transmits and receive reports as requested by the Master

Keeps log of events and progress. The Master can also assign these duties to Third Officer.

Chief Officer : Oil Pollution Control Officer, also keeping the Master advised & updated on the situation.
Mobilizes Oil Pollution Team as necessary, to limit the oil spill & to start the clean-up operations.

Chief engineer: In charge of Engine Department.
In charge of bunker operation
Take action as directed by Master, or Oil Pollution Control Officer.
Starts fire/ foam pump as required.

Deck officer on duty :(Loading : Topping Off cargo tanks)

In the event of spilled on deck, stops the loading by advising the loading Master.

Reduces the level of the overflowed tank to empty/slack tank.

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Mobilizes Oil Pollution Team
Alerts and inform the Master/ Chief Officer of the incident.

Pump man (on Tankers): Assist the Chief Officer.

Ensures that the air driven pump are properly rigged tested before starting the cargo operations
And that all other Oil Spill Equipment is readily available at the established locations.

Responsible for recovering the oil spilled on deck by operating the air driven pumps, collecting
The oil in slop tanks or other slack tank.

Fitter

The fitter and the pump man must ensure that the air portable pumps are rigged and tested
Before the start of bunkering operation and that all other **Oil Spill Equipment** is reavailable at
Established location.

In the event of an oil spill on deck, assists the pump man in operating the air portable pumps to
Recover the oil into empty drums, slop tanks, or into Engine Room empty tank (if available),
Under direction of the Chief Engineer/Oil Pollution Control Officer.

Engineer on duty : (other duties as directed By Chief Engineer)

Assists The Chief Engineer during the bunkering operations.
Ensures that air/electric power is maintained on deck during the bunkering or cargo operations.
Prepares for Fire-fighting Ensures that sufficient air on deck is maintained.

Deck hands on deck:

If an oil leakage is detected, immediately alert the officer on duty.
Prepare for Oil Pollution Control action.
Position observant material to prevent any oil from reaching the railing.
Commence clean –up

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By using on-board clean –up equipment.

Proceed to their emergency station & await orders from Oil Pollution Control Officer & Chief Engineer.

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SOCIAL RESPOBSIBILITIES

Responsibilities of ship owners:

1. Safety & health of all seafarers on board should have a suitable policy on the safety and health which agreeable with national and international laws.

2. Provide and maintain ships, equipment , and tools, operating manuals as far as possible so that there is no risk of accident or injury to seafarers.

3. As per national & international laws decide manning levels, taking into account necessary standards of fitness, state of health, experience, competence and language skills to ensure the safety & health of seafarers. (Working and living conditions, working hours, rest periods, adequate accommodation, nutrition, valid competency, proficiency & medical certificates, ensure common language skills for accident-free operation of the ship).

4. Monitor the performance of equipment and personnel.

5. To establish safety and health committee on board ships who implement ship owner's safety and health policy.

6. To arrange for regular safety inspections of theirs ships, its equipments and machinery at suitable intervals by competent classification societies and their representatives.

Crew Agreements:

1. The employer (through Master) will employ each seaman (officer/ crew) and the seaman will serve in the capacity and at the rate of wages expressed against his name.

2. Wages will not accrue for any hours during which a seaman refuses or neglects to work when required or is absent without leave or for any period during which a seaman is incapable or performing his duties by reason of illness or injury which has been caused by his own willful act or default

3. If any pension fund/ provident fund scheme exists, then the contributions to such funds as per company's laws will be deducted from your wages.

4. Any seaman who incompetently performs his work in the capacity in which

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he was first employed under the agreement may be re-rated by the Master.

5. Agreement may be terminate:-
   A) By mutual consent
   B) Medical evidence indicates that a seaman is incapable of continuing to perform his duties due to illness/injury.
   C) Appropriate notice in terms of the agreement
   D) If in the opinion of the master, the continued employment of the seaman would be likely to endanger the ship or any person on board.
   E) If a seaman having been notified of the time of the vessel is due to sail, is absent.
   F) If the Master is satisfied that a breach of conduct has has occurred.

Individual rights and obligations:

Each seaman agrees

To Join the ship in the time specified by the company/master

To submit to inoculation, vaccination on and any other health precautions as may be directed by the master

To return in good condition (fair wear and tear expected) before the termination of his

Engagement/contract all articles provide for his personal use during the period of his Engagement/ contract.

That all stores an provisions issue to the crew are only for use and consumption on board

The ship and any unused or unconsumed stores provisions remain the property of the Employer.

Acts of Misconduct:

1. Assault
2. Willful damage to ship or any property on board.
3. Theft or possession of stolen property
4. Possession of offensive weapons
5. Persistent or willful failure to perform duty
6. Unlawful possession or distribution of drugs.
7. Conduct endangering the ship or person on board
8. Combining with others at sea to improve the progress of the voyage or navigation of the ship.
9. Disobedience of orders relating to safety of the ship or any person on board.

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10. To be asleep on duty or fail to remain on duty if such conduct would prejudice the safety of the ship or any person on board.
11. In capacity through the influence of drink or drugs to carry out duty to prejudice of the safety of the ship or any person on board.
12. To smoke, use a naked light or an unapproved electric torch in any part of the ship carrying dangerous cargo or stores where smoking or the use naked lights or unapproved torches is prohibited.
13. Intimidation (frighten), coercion (persuade by force) an interference with the work of other employees.
14. Behavior which seriously detracts from the safe an efficient working of the ship; and the social well-being of any other person on board (e.g. ragging.)
15. Causing or permitting unauthorized person to be on board the ship whilst it is at sea (e.g. giving shelter/food to stowaways)

Actions which may be taken when breach of Code/Conduct is done:

1. Informal warning by crew in-charge(C/O or 2/E).
2. Formal warning by head of department, which will be suitable, recorded(C/O or C/E)
3. Formal warning by the master recorded in the ship's official logbook.
4. Written reprimands(warning) administered by the Master and recorded in the ship's official
   Logbook.

Some examples where Master has authority to make a deduction from wages:

1. Seaman absence without leave.
2. Committed breach of code of conduct.
3. Willful damage to ship's equipment, and also in respect of a seaman's failure to return in good condition (fair, wear an tear expected) articles provided by the employer for the seaman's personal use.

Confidential Report (C.R.) of officers and crew :

Sent once every three months to head office and owners. The Confidential report contains the officers and crews conduct , ability, obedience, initiative , integrity, loyalty, honesty, leadership, qualities, sobriety, personal relationship with crew etc. etc.

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The above report are sent when Master or Chief Engineer or Chief Officer signs off. No copies are kept on board.

PERSONS NEED:

1. **PHYSIOLOGICAL NEEDS:** Such as food, clothing, shelter, thirst, sleep , sex

2. **SAFETY OR SECURITY NEEDS :** To remain free from hazards, accidents, wars, disease and economic stability
3. **SOCIAL NEEDS**: To remain free from hazards, accidents, wars, disease and economic stability.
4. **ESTEEM/ RESPECT NEEDS :** Self-respect, prestige, honor for one self and for others.
5. **SELF ACTUALIZATION NEEDS :** Related to developments of own's physical and moral personality.

FACTORS LEADING TO MAL-ADJUSTMENT:

1. Family attitude (Faulty parental attitudes)
2. Inconsistency of values (Do as I say and not as I do)
3. Authorization Disciplining
4. High expectations
5. Over Projection
6. Rejection
7. Identification
8. Jealousy
9. Communication
10. Family Instability
11. Personal factor

DISCIPLINE:

Discipline is an attempt to help managers to determine what needs to be done, when their people begin to regress and behave less maturely than in the past. Disciplinary intervention is necessary to redefine roles and expectations.

Remember when disciplining an individual:

a) Don’t blow your cool
b) Don't attack personalities
c) Be specific
d) Be timely
e) Be consistent(No favorites)

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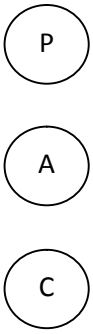
f) Don't threaten
g) Be fair

TRANSACTIONAL ANALYSIS:



WHAT YOU ARE AS A PERSON?

The figure above is a diagram of a human being. Each person has three ego states which are separate and distinct sources of behavior: the Parent ego state (P); the Adult ego state (A); and the Child ego state (C). These are not abstract concepts but realities.

The Parent ego state contains the attitudes and behavior incorporated from external sources, primarily parents. Outwardly, it often is expressed towards others in prejudicial, critical and hurting behavior. Inwardly, it is experienced as old parental messages, which continue to influence the inner Child.

The Adult ego state is not related to a person's age. It is oriented to current reality and the objective gathering of information. It is organized, adaptable and intelligent and functions by testing reality, estimating probabilities and computing dispassionately.

The child ego state contains all the impulses that come naturally to an infant. It contains the recordings of the child's early experiences as behavior from childhood.

When you are acting thinking feeling as you observed your parents to be doing, you are in your parent ego state.

When you are feeling and acting as you did when you were a child, you are in your child ego state. People can feel, smell, touch, speak, listen, look and act from each ego state. Each ego state has its own programming, some people respond from one ego state more often than from the others. People for example who tend to respond more often from their parent ego state view the world as they observed their

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parents viewing it. In this case their ability to sense the world or themselves is diminished or distorted.

Employees Duties and Rights:

Duties:

1. Duty towards work
2. Duty towards subordinates
3. Duty towards organization
4. Duty towards consumers
5. Duty towards nation
6. Duty towards self

Rights:

1. Right to Privacy
2. Right to Information
3. Right to Personal Data
4. Right to Access
5. Right to Confidentiality
6. Right to Security
7. Right to Surveillance

CULTURAL INTER RELATIONSHIP:

A. Respect
B. Understanding
C. Language & Body Sign Interpretations
D. Name
E. Background and Religious Beliefs
F. Cultural Procedures
G. Learning

BASIC HUMAN VALUE

Traditional Values:

1. Honesty and Truth
2. Righteousness - choose right type of behavior, what is my duty towards my shipmates, towards my shipping company or my country.
3. Patriotism
4. Justice, Equality and tolerance
5. Non- violence, co-operation

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What workers want from the job?

1. Job security
2. Promotion
3. Appreciation
4. Good wages
5. Good working conditions on board
6. Sense of touch (feeling in)
7. Willing to participate
8. Sympathetic Understanding
9. Relief in time

Leadership Qualities:

1. Self Control
2. Decision making
3. Un wearing courage
4. A pleasing personality
5. Mastery of detail
6. Willingness to assume full responsibility
7. Habit of doing more than paid
8. A sense of justice
9. Co-operation
10. Sympathetic Understanding

Self Control:

1. Control your desire
2. Control Emotion
3. Control emotion of love and sex
4. Control emotion of Hope
5. Control emotion of Faith
6. Show no negative emotion like fear, Jealousy, hatred, revenge, greed, superstition, anger

Maturity:

1. Positive attitude
2. Emotional balance, joy, fear, love
3. Dealing with frustrations
4. Decision making ability
5. Sense of justice
6. Goal setting
7. Self insight
8. Capacity of giving and taking

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9. Showing no frustrations

ALCOHOL AND DRUG ABUSE IN MERCHANT NAVY

A mariner over the years has earned an image of a loner a survivor a "man" an adventurer, and one who enjoys each and every moment of his life.

The marine industry image was synonymous with the famous there W's Wealth, women, and Wine; of these the last one has been a source of constant attention owing to the potential danger of accidents and crisis occurring due to alcoholism and other forms of drug abuse.

Alcoholism has been associated with the marine the marine industry from the very beginning. It is an old belief, an image of merry making people or big sea pirates with a mug of beer in their hand. Which has left impressions of this particular association between seafarers & alcohol. This image in today's context is however unfair as many vessels have opted for the alcohol free environment, & international rules and regulations are having a significant effect.

On searching for probable cause of drinking among mariners; one very obvious cause is loneliness and being away from family and home. Young officers, who join the industry, often find themselves in an atmosphere of all male company. An occasional and casual drink might soon lead to habitual drinking . Since the industry is stressful and has difficult working conditions; alcohol provides an attractive escape from it.

For many young men, joining the merchant navy means the first opportunity to earn money, be away from home and develop independence. This newfound freedom provides another opportunity to " try out" alcohol, cigarettes, and other drugs. The innocence of social use always has the potential to lead to abuse. When the habit becomes out of individual's immediate control.

Drug and alcohol has physical, emotional and psychological symptoms but often it is a symptom in itself. A symptom of loneliness, lack of confidence, self-esteem etc. If the industry has to address the problem, it needs to focus on alleviating and rectifying these internal issues and individual needs. Companies have to be very sensitive about their officer's needs and background and at the same time they should have their own strict Drug and Alcohol Policies. We need a more concerted effort to eradicate this great potential danger or accidents and crises. Which continues to be a source of loss of health; life and resources.

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STCW'95 PREVENTION OF DRUG & ALCOHOL ABUSE:

Guidance to Prevention of Drug & Alcohol abuse

Drug & Alcohol abuse directly affect fitness and ability of a seafarer to perform watch-keeping duties. Seafarers found to be under the influence of drugs or alcohol should be permitted to

Perform watch-keeping duties until they are no longer inspired in their ability to perform those duties.

Administration should consider developing the national legislation:
1 . Prescribing a maximum of 0.04% blood alcohol level (BAC) during watch keeping duty as a minimum
Safety standard on their ships and
2. Prohibiting the consumption of alcohol within 4 hours prior to serving as a member of a watch.

The OCIMF guidance on the subject, which is considered the most widely accepted international guidelines, is attached.

Oil Company's International Marine Forms (OCIMF) Guidelines For The Control of Drugs & Alcohol On Board ship

Drug & Alcohol abuse & its adverse effects on safety is one of the most significant social problems of our time. It is, appropriately, receiving attention both in the public eye and in Government legislation. An example specify to the Marine industry, of Government attention in this issue is the U.S. Coast Guard(USCG) Regulations on the testing of personnel on National & Foreign Flagships.

Recognizing the potential , serious impact on the Marine incidence, the Oil Company's International Marine Forum (OCIMF), & the Marine industry in general, have over years develop guidance aimed at encouraging safe ship operation & protection of the environment. Whilst tanker companies have generally operated with strict policies related to drugs and alcohol use on board their ships. OCIMG considers that the industry as a whole reassess the control of drugs & alcohol on the board ships.

OCIMF recommends that shipping company should have a clearly written policy on drug and alcohol which is easily understood by the seafarers as well as shore based staff. In order to enforce their policy, companies should have rules of conduct and controls in place, with the objective that no sea farers will navigate ship or operate its on board equipment whilst impaired by drugs and alcohol. It is recommended that the seafarers be subject to testing & screening for drugs &

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alcohol abuse by means of unannounced testing should be sufficient so as to serve & effective determine to such abuse.

The misuse of legitimate drugs, or the use, possession, distribution or sale of illicit or un prescribed controlled drugs which causes or contributes to unacceptable job behavior should require the seafarers to b excused from duty, until such times they are repatriated, or treated for the cause of after effects.

The suggested list of substances to be prohibited should include, but not be limited to marijuana, cocaine, opiates, phencyclidine (PCP) & amphetamines & their derivatives. In this regard, the International Chamber of Shipping (ICS) has published guidelines on recognition and detection of drug trafficking an abuse entitled "Drug Trafficking and Drug Guidelines for owners and Masters on Recognition of Consumption. This Company policy should provide for control of onboard alcohol distribution and monitoring of consumption. This policy should support the principle that officers and ratings should not be inspired by alcohol while performing schedule duties.

OCIMF recommends that officers and ratings observe a period of absenteeism from alcohol prior
To closing up on scheduled watch. This may be either a fixed period, such as the 4 hours required by the USCG, or a minimum period of 1 hour of abstinence for each unit of alcohol consumed (refer to section 3.4 for example of approximate alcohol unit conversions). Whichever method is used to determine the abstinence period, the blood alcohol content of the seafarers is theoretically, zero. Officers and ratings should be aware that local regulations might be in place anywhere this is the case, it is recommended that these be strictly adhered to where they exceed their guidelines.

Recognizing that all seafarers must be able to respond at any time to an emergency situation, the International Maritime Organisation (IMO) is considering including guidance to administrations on maximum permissible blood alcohol content (BAC) permitted whilst on board.

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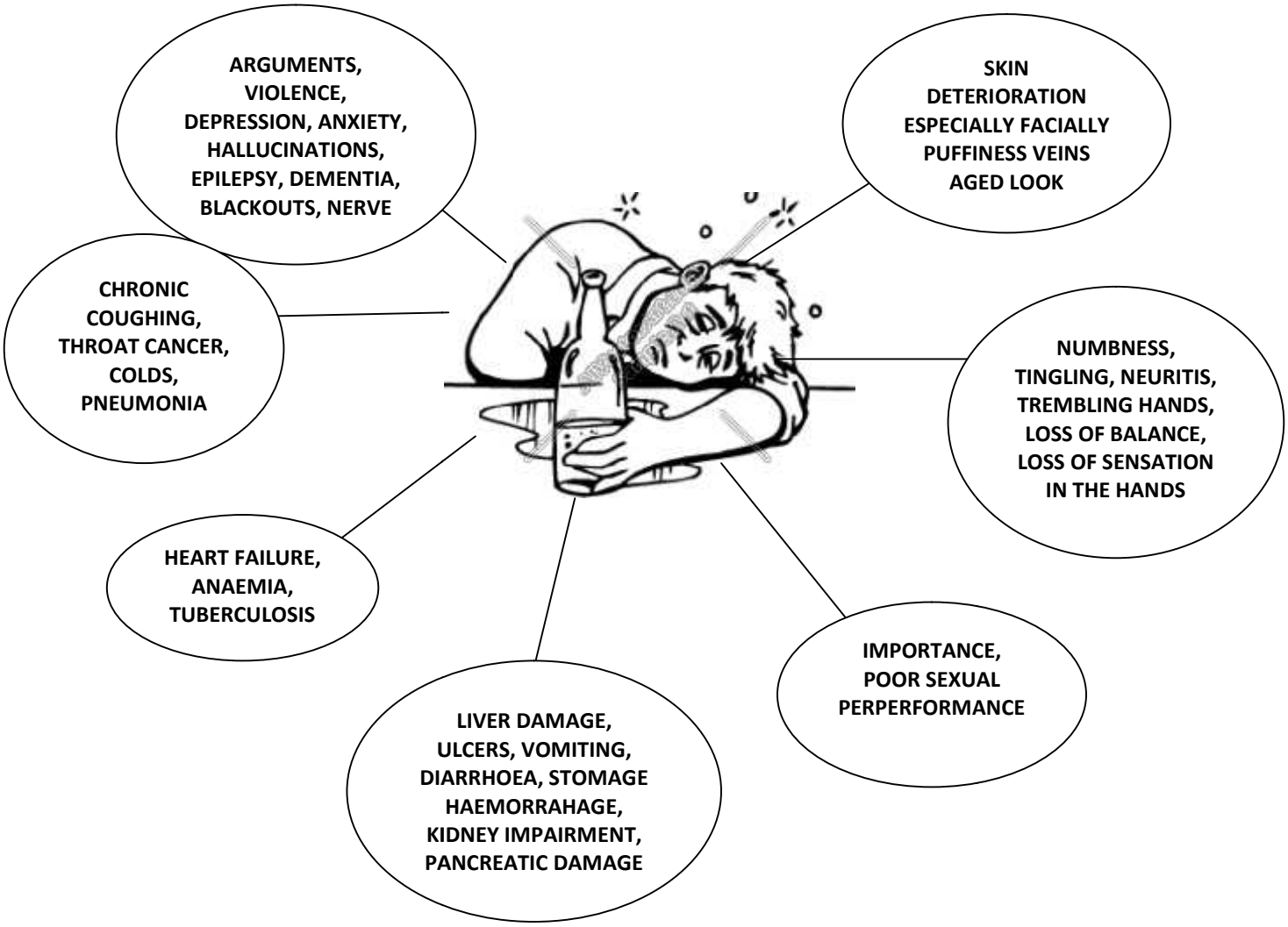
LONG TERM EFFECT OF EXCESSIVE ALCOHOL CONSUMPTION



BASIC GUIDELINES ON CONSUMPTION OF ALCOHOL

Any consumption of alcohol by persons onboard shall not result in blood alcohol concentration (BAC) of more than 0.04% by weight at anytime.

Watch keeping Office and Ratings will not consume any alcoholic beverages four prior to their watch-keeping duties.

No alcoholic beverages are to be served on the dining table during meal hours. It is brought to attention of all persons onboard that 2 units of alcohol consumed

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within the hour will result in BAC of 0.04% by weight and for their guidance 1 unit of alcohol may be defined as follows:-

APPROXIMATE ALCOHOL UNIT CONVERSIONS

	Volume	Units		Volume	Units
Beers, Cider & Ledgers.			Table wines 10c Otherw>6.0%<12% Alc. By Vol.	1.0 1 liter bottle	10.0
Extra strength (>4.0%<6.0% A/c. By Vol.)	10oz 30cl	2.5 2.5	Sherry Forfeited Wines Others](>12%<16%A/c. By Vol.)	6cl 1 liter bottle	1.0 16.0
Ordinary Strength (>1%<4.0% A/c. By Vol.)	10oz 30cl	1.0 1.0	Spirits, Liquor, Liqueurs, Others (>16%<40%A/c. By Vol.)	1oz 3 cl	1.0 1.0
Low Alcohol (>0.05%<1.0% A/c. By Vol.)	10oz 30cl	0.5 0.5	Any other low alcohol Beverage (>0.05%<1.0% A/c. By Vol.)	10oz 30oz	0.5 0.5

Alcohol metabolizes out of boy at an average rate of (1) one unit of alcohol per hour.

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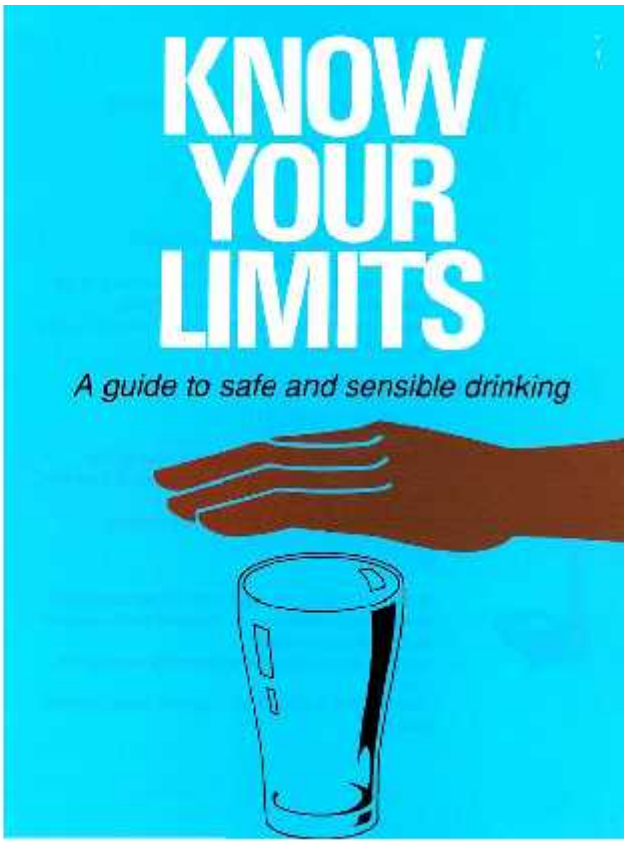

Danger for men 21 units for women 16 units

Get the better of drinks before drinks get the better of you!!!
Drinking excessively damages your liver.
It kills brain cells and can damage the nervous system.
It can cause high blood pressure, obesity and diabetes and increases the danger of heart attacks.
It can also lead to cancer of the mouth and throat.
It takes the body one hour to get rid of unit of alcohol from the blood stream & there is no way of speeding up process.
So if you drink a pint of beer, there will be alcohol in your blood when you report for your duty.

In the interest of health and safety, seafarers should be actively encouraged not to exceed consumption levels, which could affect long-term health. Information should be provided to seafarers on alcohol consumption in relation to impairment, its impact on behavior and health and availability of rehabilitation programmed.

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OCIMF is firmly of the opinion that is in the best of all sectors of the maritime industry to positively respond to these guidelines and thus work to ensure a safe workplace for seafarers and to protect the safety and well being of the public and the environment.

SHORT TERM EFFECTS OF ALCOHOL CONSUMPTION

Up To 0.4% Feeling Of Well Being	Some Judgment, Impairment Talkative, Related Sociable
0.04%- 0.08% Risk State	Judgment Impairment, Movement Affected, False Confidence
0.08%- 0.15% Dangerous State	Slow Speech Balance, Affected Eye Sight Blurred Falling A Sleep, Vomiting
0.15%- 0.4% Drunken Stupor	Heavy Breathing Dead, Drunk Incontinence, Coma
0.4%- 0.6& Death	Shock & Death

LONG TERM EFFECT OF EXCESSIVE ALCOHOL CONSUMPTION

Arguments, Violence, Depression, Anxiety, Hallucinations epilepsy, Dementia, Blackouts, Nerves Damage, Skin Deterioration Especially, Facially Puffiness Veins Aged Look, Chronic coughing., Throat Cancer, Colds, Pneumonia, Heart Failure, Anemia, Tuberculosis, Numbness, Tingling, Neuritis, Trembling Hands, Loss of Balance, Loss of Sensation in the hands, Liver Damage, Ulcers, Vomiting, Diarrhea, Stomach Hemorrhage, Kidney Impairment, Pancreatic Damage, Importance, Poor Sexual Performance

DRUGS

Any seafarer who has used drugs other than on approved medical grounds or been involved in the possession or distribution of drugs will be subject to company disciplinary procedures & liable to summary dismissal from employment.

This sanction will be applied if an offence is committed while the seafarers are employed. Whether on or off a crew agreement on board or ashore.

In most countries drug abuse is regarded as a very serious offence.

In some, the penalty is death, in others a long prison sentence. The presence of drugs on board can also lead to detention of the ship an heavy fines.

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So don't be tempted by drugs. They can lead to ill health and death, cause accidents and cost you your job and career.

DRUGS THAT YOU SHOULD KNOW

It is estimated that there are in excess of 10,000 regular abuses of "hard drugs" such as heroin ad cocaine in the UK. There are also many thousands of other abusers of the so-called: soft drugs lide cannabis and amphetamines.
Drug user comes from every social group & every type of background. Abuse of any drug can lead to addiction & overdoses of "hard drug" can lead to death.
Intravenous drug abuse is also well recognized as a source of transmission of the Hepatitis B and AIDS viruses.
Contrary to widely held belief there are no safe drugs. They can all lead to physical and mental deterioration, affect behavior adversely and impair the ability to work. This can jeopardize personal safety, the safety of the others, the ship & the environment.
The most commonly abused drugs are:

DEPRESSANTS

Depress the central nervous system.
Opioids: heroin (II, smack, junk), morphine, codeine, opium, methadone, path dine. Cannabis (grass, pot, weed, hash, dope, joint, refer)
Barbiturates (downers, barbs). Tranquillizers (tranks); Valium, Librium

STIMULANTS

Stimulate the central nervous system.
Cocaine (coke, snow, crack).
Amphetamines (speed, uppers, whizz, blues, sulpha)

HALLUCINOGENS

Alter moods and perception.
Lysergic acid diethylamide (LSD, acid)
Magic mushrooms.

SOLVENTS

Alter moods and perception
Solvents of glue, paint, nail varnish remover, dry cleaning fluids etc.

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International Measures Covering Accident Protection & Occupational Hazards:

On all the international hazards dealing with maritime safety, the most important is the international. Convention for safety of life at life at sea. (SOLAS). It is also one of the oldest, versions having been adopted in 1914. The incident which led to this convention was sinking of Titanic on her voyage when more than 1500 passengers & crew died. It lays down rules regarding construction, life saving appliances, communication, carriage of grains & dangerous goods.

MARPOL 73/78 deals with protection of Marine Environment due to oil discharges, noxious substances, sewage & garbage from ships.

Collision regulation of 1972 (COLREGS) contain mandatory rules to be observes by ships when navigating in the seaway and have contributed immensely in the prevention of accidents due to collisions.

STCW'95 Convention is also aimed at furthering the cause of safety on board by laying down minimum standards of competence for the seafarers in the prevention of fatigue accidents by setting out minimum rest periods.

Load line rules of 1966 establish the minimum free board requirements so that the sea worthiness of the ship maintained in all condition of loading.

Monitoring of the requirements of the conventions is carried out by post State Control inspectors who have the authority to detain un seaworthy or unsafe ships due to construction or manning deficiencies. Dock regulation of the individual countries, code of safe working practice for merchant seaman (UK), M-Notices, international health regulation & other ILO regulations covering crew safety have also contributed to minimizing the occupational hazards on board. In addition to the international measures, the companies have their own safety / health requirements, which are covered in their safety, drug & alcohol & operational manuals.

IMO has instituted safety management code (ISM code) for safe operation of ships and pollution prevention. Its objective is to prevent human injury or loss of life, to avoid damage to the environment & to the property. This is ensured by requiring the shipping companies to provide safe working practices & environment, establish safe guard against all identified risks & continuously improve safety management skills of personnel for emergencies.

INTERNATIONAL SAFETY MANAGEMENT CODE (I.S.M. CODE)

The International Safety Management Code (I.S.M.Code) for the safe operation of ships & pollution prevention was established by IMO in 1993, which can be termed as the marine Equivalent to ISO 9000.

Purpose:

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To provide an International Standard for the safe management & operation of ships & for pollution prevention.
Ensure safety at sea, prevention of human injury or loss of life & avoidance of damaging the environment, particularly the marine environment & to property.
To take account & to follow the mandatory rule & regulations recommended by organization, administration, classification societies & marine industry.

ACCIDENT PREVENTION ON BOARD

1. Seafarers should participate in ensuring safe working conditions & should be encouraged to express view on working procedures.
2. Seafarers should have the right to remove themselves from dangerous situation or operation when there is an eminent & serious danger to their safety & health.
3. Should co-operate with the ship owners.
4. Use and take care of protective clothing / equipment their disposal
5. Participate in safety and health meeting
6. Seafarer should not operate or interfere with equipment, which they are not authorized
7. Orders should be given and taken clearly and understood.

CAUSES OF ACCIDENT

Avoidable Causes:

Carelessness - Lack of proper attitude
Unawareness - Lack of instructions
Ignorance - Lack of onboard training
Fatigue - Lack of sleep, rest
Machinery failure - Mostly is avoidable through routine inspection & prevention maintenance

Unavoidable Causes:

ACT OF GOD - Lightening, bad weather etc.

Lack of Control of Operation:

a) Unsafe actions:

1) Procedures not followed
2) Shortcuts taken
3) Poor attitude

b) Productivity only concerned

1) Too busy for safety
2) Safety receive lip service only
3) Safety during stock period only.

c) Inadequate onboard training

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1) Poor or incomplete instructions
2) Insufficient written procedures
3) No job safety analysis

d) <u>Poor work environment</u>

1) Unsafe conditions
2) Inadequate & improper tools/equipments
3) Poor house keeping
4) Inadequate rust, vapor, noise control

COMMON CAUSES OF INJURY:

a. Striking against or being struck by object.
b. Caught in, on or to between objects.
c. Falling at the same level or to a different level.
d. Contact with cold and hot object.
e. Inhaling / absorbing through the skin / swallowing.
f. Over exertion while lifting / pulling / pushing.

TECHNIQUE FOR PREVENTION ACCIDENTS

a. Determine the cause of all accidents.
b. Investigate (loss or injury) all accidents.
c. Investigate crew member complaints / grievances.
d. Follow safety suggestions
e. Review work procedures
f. Perform job safety analysis on hazardous job.

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MARPOL Annex V which entered into force on 1 January 2013

DISCLAIMER: Additional requirements may apply.

This simplified overview is for information or reference purpose only and is not meant as a substitute for the comprehensive provisions in the revised MARPOL Annex V (resolution MEPC.201(62) or the 2012 Guidelines for the Implementation of MARPOL Annex V (resolution MEPC.219 (63).

Type of garbage	Ships outside special area	Ships within special area	Offshore platform and all ships within 500 m of such platforms
Food waste comminuted or ground	Discharge permitted ≥3 nm from the nearest land and en route	Discharge permitted ≥12 nm from the nearest land and en route	Discharge permitted ≥ nm from the nearest land
Food waste comminuted or ground	Discharge permitted ≥ 12 nm from the nearest land and en route	Discharge Prohibited	Discharge Prohibited
Cargo residues not contained in wash water	Discharge permitted ≥ nm from the nearest land and en route	Discharge Prohibited	Discharge Prohibited
Cargo residues contained in wash water		Discharge only permitted in specific circumstances and ≥ 12 nm from the nearest land and en route	Discharge Prohibited
Cleaning agents and additives contained in cargo hold wash water	Discharge permitted	Discharge only permitted in specific circumstances and ≥ 12 nm from the nearest land and en route	Discharge Prohibited

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Cleaning agents and additives contained in deck and external surfaces wash water		**Discharge Permitted**	**Discharge Prohibited**
Carcasses of animals carried on board as cargo and which died during the voyage	**Discharge permitted as far from the nearest land as possible and en route**	**Discharge Prohibited**	**Discharge Prohibited**
All other garbage including plastics, domestic wastes, cooking oil, incinerator ashes, operational wastes and fishing gear	**Discharge Prohibited**	**Discharge Prohibited**	**Discharge Prohibited**
Mixed Garbage	**When garbage is mixed with or contaminated by other substances prohibited from discharge or having different discharge requirements, the more stringent requirements shall apply.**		

1. **These substances must not be harmful to the marine environment.**
2. **According to regulation 6.1.2 of MARPOL Annex V, the discharge shall only be allowed if (a) both the port of departure and the next port of destination are within the special area and the ship will not transit outside the special area between these ports (regulation 6.1.2.2); and (b) if no adequate reception facilities are available at these ports (regulation 6.1.2.3)**

<u>Maritime Labour Convention 2006</u>

51. The relevant extracts of the MLC 2006 are given below:-

Regulation 2.3 – Hours of work and hours of rest

Standard A2.3 – Hours of work and hours of rest

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1. For the purpose of this Standard, the term:-
    a) Hours of work means time during which seafarers are required to do work on account of the ship.
    b) Hours of rest means time outside hours of work; this term does not include short breaks.

2. The limits on hours of work or rest shall be as follows:-
    a) Maximum hours of work shall not exceed:-
        i. 14 hours in any 24 hour period; and
        ii. 72 hours in any seven-day period.
    b) Minimum hours of rest shall not be less than:-
        i. Ten hours in 24-hour period; and
        ii. 77 hours in any seven-day period.

3. Hours of rest may be divided into no more than two periods, one of which shall be at least six hours in length and the interval between consecutive periods of rest shall not exceed 14 hours.

4. Masters, fire-fighting and lifeboat drills, and drills prescribed by national laws and regulation and by international instruments, shall be conducted in a manner that minimizes the disturbance of rest periods and does not induce fatigue.

5. When a seafarer is on call, such as when a machinery space is unattended, the seafarer shall have an adequate compensatory rest period if the normal period of rest is disturbed by all-outs to work.

6. If no collective agreement or arbitration award exists or if the competent authority determines that the provisions in the agreement or award in respect of paragraph 4 or 5 of this Standard are inadequate, the competent authority shall determine such provisions to ensure the seafarer concerned have sufficient rest.

7. Each Member shall require the posting in an easily accessible place, of a table with the shipboard working arrangements, which shall contain for every position at least:
    a) The schedule of service at sea and service in port; and
    b) The maximum hours or the minimum hours of rest required by national laws or regulation or applicable collective agreements.

8. The table referred to in paragraph 7 of this standard shall be established in a standardized format in the working language or languages of the ship and in

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English.

9. Each Member shall require that records of seafarer's daily hours of work or of their daily hours, of rest be maintained to allow monitoring of compliance with paragraphs 2 to 7 inclusive of this Standard. The seafarer shall receive a copy of the records pertaining to them which shall be endorsed by the master, or a person authorized by the master, and by the seafarers.

10. Nothing in this Standard shall be deemed to impair the right of the master of a ship to require a seafarer to perform any hours of work necessary for the immediate safety of the ship, persons on board or cargo, or for the purpose of giving assistance to other ships or persons in distress at sea. Accordingly, the master may suspend the schedule of hours of work or hours of rest and require a seafarer to perform any hours of work necessary until the normal situation has been restored. As soon as practicable after the normal situation has been restored, the master shall ensure that any seafarer who have performed work in as scheduled rest period are provided with an adequate period of rest.

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PERSONAL SURVIVAL TECHNIQUES

COURSE *HANDOUT*

(IMO Model Course 1.19/STCW A-VI/1)

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(Ministry of Shipping, Government of India)
www.dgshipping.gov.in

CONTENT				
Section	**Details**	**Pages**	**Revision**	**Date**
A	Content	1	00	01-Feb-2018
B	Revision Record	1	00	01-Feb-2018
C	Course Outline	1-2	00	01-Feb-2018
D	Introduction	1	00	01-Feb-2018
01	Introduction, Safety & Survival	1-9	00	01-Feb-2018
02	Emergency situations	1-10	00	01-Feb-2018
03	Evacuation	1-3	00	01-Feb-2018
04	Survival Craft and Rescue boats	1-12	00	01-Feb-2018
05	Personal Life-saving appliances	1-8	00	01-Feb-2018
06	Personal Life-saving appliances **(Demonstrations)**	1	00	01-Feb-2018
07	Survival at sea	1-18	00	01-Feb-2018
08	Emergency radio equipment	1-8	00	01-Feb-2018
09	Helicopter assistance	1-5	00	01-Feb-2018

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Section	Details of Revision	Revision No.	Date

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PERSONAL SURVIVAL TECHNIQUES
COURSE OUTLINE

Duration 2.5 days

Subject Area	Lecture	Demo & Practice
1. Introduction, Safety & Survival 1.1 Safety Guidance 1.2 Principles of Survival at sea 1.3 Definitions, survival craft and appliances 1.4 SOLAS Training manual 1.5 Safety Symbols	0.75	Lecture / Presentation
2. Emergency situations 2.1 Types of emergencies 2.2 Precautions 2.3 Fire Provisions 2.4 Foundering 2.5 Crew expertise and initial familiarization 2.6 Muster List and emergency signals 2.7 Crew and emergency instructions 2.8 Extra equipment and survival 2.9 Abandon ship - complications	1.5	Lecture / Presentation
3. Evacuation 3.1 Abandoning ship ' last resort 3.2 Personal preparation for abandoning ship 3.3 Need to prevent panic 3.4 Crew duties to passengers 3.5 Crew duties ' launching survival craft 3.6 Master's orders to abandon ship 3.7 Means of Survival	0.75	Lecture / Presentation
4. Survival Craft and Rescue boats 4.1 Lifeboats 4.2 Life rafts 4.3 Rescue boats	2.25	Lecture/ Presentation/ Workshop/ Exercises
5. Personal Life-saving appliances 5.1 Lifebuoys 5.2 Lifejackets 5.3 Immersion suits/anti-exposure suit 5.4 Thermal Protective aids	0.75	Lecture

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6. Personal Life-saving appliances **(Demonstrations)** 6.1 Lifebuoys 6.2 Lifejackets 6.3 Inflatable lifejackets 6.4 Immersion suits or anti-exposure suit 6.5 Thermal protective aids 6.6 Personal survival without a lifejacket 6.7 Boarding survival craft		3.75
7. Survival at sea 7.1 Dangers to survivors 7.2 Best use of survival craft facilities	0.75	Lecture/ Presentation/ Workshop/ Exercises
8. Emergency radio equipment (Lecture and Demonstrations) 8.1 Portable radio apparatus for survival craft 8.2 Emergency position-indicating radio beacons (EPIRBs) 8.3 Search and Rescue transponders (SARTs)	1.0	1.0 (Lecture/ Presentation/ Workshop/ Exercises)
9. Helicopter assistance 9.1 Communicating with the helicopter 9.2 Evacuation from ship and survival craft 9.3 Helicopter pick-up 9.4 Correct use of helicopter harness	1.0	0.5 (Lecture/ Presentation/ Exercises/ Contingency plans for various security related emergencies)
Review and Final Assessment	1.0	
Sub Total	**9.75**	**5.25**
Total	**15.0 hours**	

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1. Aim

This model course aims to meet the mandatory minimum requirements for seafarers for familiarization, basic safety training and instruction in accordance with Section A-VI/1 of STCW Code.

2. Objectives

This syllabus covers the requirements of the 1978 STCW Convention as amended and Code Chapter VI, Section A-VI/1. On meeting the minimum standard of competence in personal survival techniques, a trainee will be able to survive at sea in the event of ship abandonment.

The trainee will be able to:

- Don a lifejacket
- Don and use an immersion suit
- Safely jump from a height into the water
- Right an inverted liferaft while wearing a lifejacket
- Swim while wearing a lifejacket
- Keep afloat without a lifejacket
- Board a survival craft from ship and water while wearing a lifejacket
- Take initial actions on boarding survival craft to enhance chance of survival
- Stream a drogue or sea-anchor
- Operate survival craft equipment
- Operate location devices, including radio equipment.

3. Entry Standards

This course is principally intended as basic training for seafarers employed or engaged in any capacity on board ship as part of the ship's complement with designated safety duties in operation of the ship. There are no particular educational requirements. All trainees must be certified by a doctor to be in good health.

4. Required Attendance

100% attendance is required for successful completion of the course.

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Chapter 1

INTRODUCTION

REMEMBER – NEVER TAKE A CHANCE WHILE AT SEA OR WORKING IN OR AROUND WATER. ALL TOO MANY ACCIDENTS HAPPEN BECAUSE PEOPLE BECOME COMPLACENT AND BELIEVE NOTHING WILL EVER HAPPEN TO THEM.

SAFETY GUIDANCE

Perhaps the most difficult survival situation to be in is sea survival. Short- or long-term survival depends upon rations and equipment available and your ingenuity. You must be resourceful to survive. Water covers about 75 percent of the earth's surface, with about 70 percent being oceans and seas. You can assume that you will sometime cross vast expanses of water. There is always the chance that the plane or ship you are on will become crippled by such hazards as storms, collision, fire, or war.

THE OPEN SEA

As a survivor on the open sea, you will face waves and wind. You may also face extreme heat or cold. To keep these environmental hazards from becoming serious problems, take precautionary measures as soon as possible. Use the available resources to protect yourself from the elements and from heat or extreme cold and humidity. Protecting yourself from the elements meets only one of your basic needs. You must also be able to obtain water and food. Satisfying these three basic needs will help prevent serious physical and psychological problems. However, you must know how to treat health problems that may result from your situation.

Precautionary Measures

Your survival at sea depends upon

- Your knowledge of and ability to use the available survival equipment.
- Your special skills and ability to apply them to cope with the hazards you face.
- Your will to live.

When you board a ship or aircraft, find out what survival equipment is on board, where it is stowed, and what it contains. For instance, how many life preservers and lifeboats or rafts are on board? Where are they located? What type of survival equipment do they have? How much food, water, and medicine do they contain? How many people are they designed to support? If you are responsible for other

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personnel on board, make sure you know where they are and they know where you are.

Down at Sea

If you are in an aircraft that goes down at sea, take the following actions once you clear the aircraft. Whether you are in the water or in a raft —

- Get clear and upwind of the aircraft as soon as possible, but stay in the vicinity until the aircraft sinks.
- Get clear of fuel-covered water in case the fuel ignites.
- Try to find other survivors.

A search for survivors usually takes place around the entire area of and near the crash site. Missing personnel may be unconscious and floating low in the water.

The best technique for rescuing personnel from the water is to throw them a life preserver attached to a line. Another is to send a swimmer (rescuer) from the raft with a line attached to a flotation device that will support the rescuer's weight. This device will help conserve a rescuer's energy while recovering the survivor. The least acceptable technique is to send an attached swimmer without flotation devices to retrieve a survivor. In all cases, the rescuer wears a life preserver. A rescuer should not underestimate the strength of a panic-stricken person in the water. A careful approach can prevent injury to the rescuer.

When the rescuer approaches a survivor in trouble from behind, there is little danger the survivor will kick, scratch, or grab him. The rescuer swims to a point directly behind the survivor and grasps the life preserver's back strap. The rescuer uses the sidestroke to drag the survivor to the raft.

If you are in the water, make your way to a raft. If no rafts are available, try to find a large piece of floating debris to cling to. Relax; a person who knows how to relax in ocean water is in very little danger of drowning. The body's natural buoyancy will keep at least the top of the head above water, but some movement is needed to keep the face above water.

Floating on your back takes the least energy. Lie on your back in the water, spread your arms and legs, and arch your back. By controlling your breathing in and out, your face will always be out of the water and you may even sleep in this position for short periods. Your head will be partially submerged, but your face will be above water. If you cannot float on your back or if the sea is too rough, float face down in the water as shown in Figure

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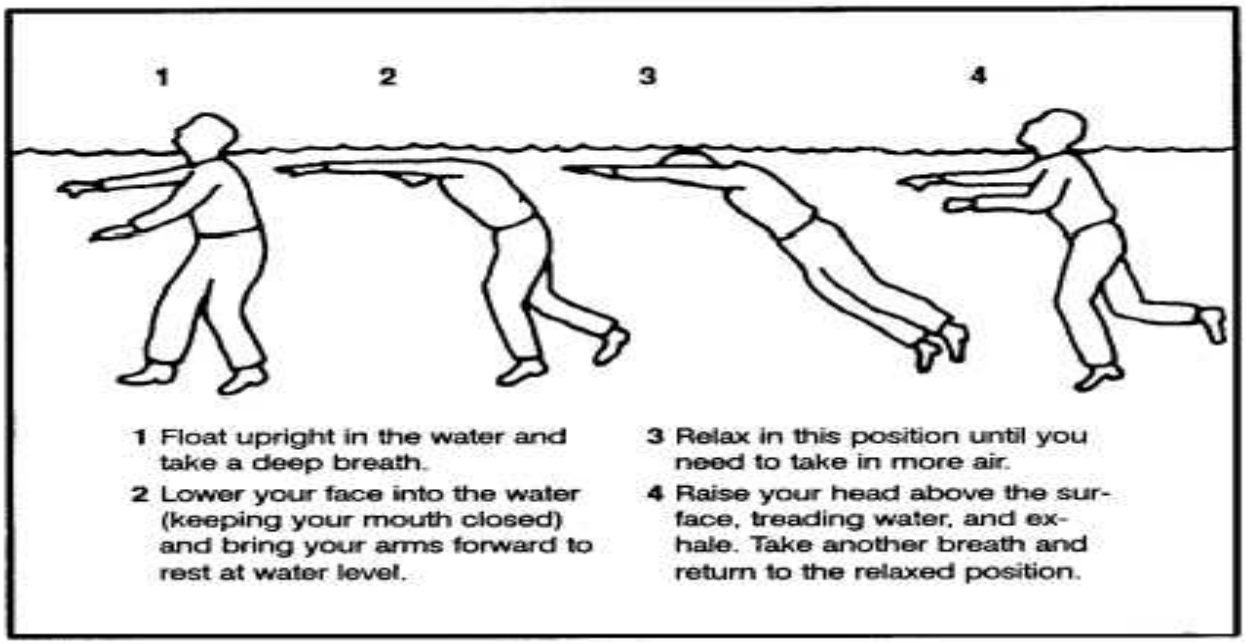

The following are the best swimming strokes during a survival situation:

Dog paddle: This stroke is excellent when clothed or wearing a life jacket. Although slow in speed, it requires very little energy.

Breaststroke: Use this stroke to swim underwater, through oil or debris, or in rough seas. It is probably the best stroke for long-range swimming: it allows you to conserve your energy and maintain a reasonable speed.

Sidestroke: It is a good relief stroke because you use only one arm to maintain momentum and buoyancy.

Backstroke: This stroke is also an excellent relief stroke. It relieves the muscles that you use for other strokes. Use it if an underwater explosion is likely.

If you are in an area where surface oil is burning

- Discard your shoes and buoyant life preserver.
  Note: If you have a uninflated life preserver, keep it.
- Cover your nose, mouth, and eyes and quickly go underwater.
- Swim underwater as far as possible before surfacing to breathe.
- Before surfacing to breathe and while still underwater, use your hands to push burning fluid away from the area where you wish to surface. Once an area is clear of burning liquid, you can surface and take a few breaths. Try to face downwind before inhaling.
- Submerge feet first and continue as above until clear of the flames.

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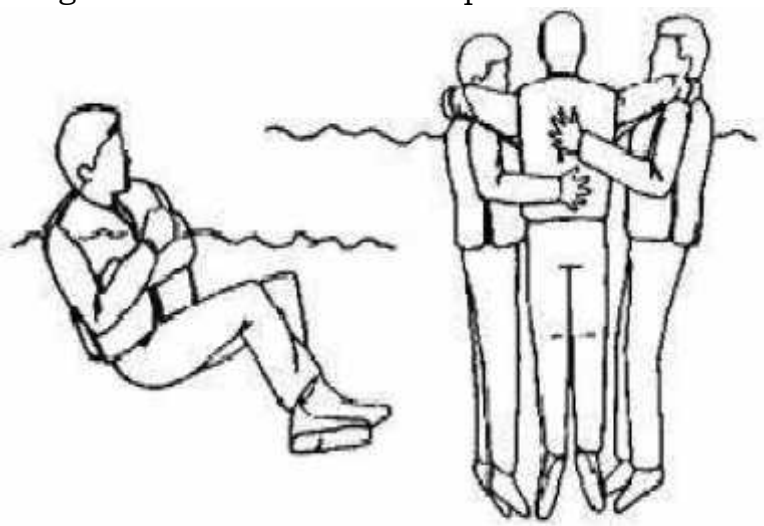
If you are in oil-covered water that is free of fire, hold your head high to keep the oil out of your eyes. Attach your life preserver to your wrist and then use it as a raft.
If you have a life jacket, you can stay afloat for an indefinite period.
In this case, use the "HELP" body position: Heat Escaping Lessening Posture (HELP). Remain still and assume the fetal position to help you retain body heat. You lose about 50 percent of your body heat through your head. Therefore, keep your head out of the water. Other areas of high heat loss are the neck, the sides, and the groin. Below figure illustrates the HELP position.



Principles of survival at sea

What is Survival?

'The very core of this course is DO NOT GETWET. Try to board your life raft or lifeboat dry. If you get wet, your chances of survival are greatly reduced.'

Survival is defined as the ability to stay alive when life is threatened after ship wreck by:
• Fire
• Explosion
• Collision
• Grounding; or
• Man overboard ('MOB').
The key to survival is knowledge and training. It may be too late to learn how to

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use a lifejacket when your vessel is flooding.

Survival Difficulties

The three main dangers to cope with in sea survival are:

- Exposure (cold shock)
- Drowning
- Lack of Water and Nourishment

You can drown, very quickly, in a small amount of water - not even a lung full is required. If your mouth and nose is not clear of the water then you may breathe in small amounts which make you cough and thus inhale more. When you fall into cold water or choppy seas, you are at most risk of drowning...however; a properly adjusted SOLAS lifejacket will provide some invaluable protection at this stage by helping to keep your airway clear of the water while getting over your initial breathing difficulties. When you survive the initial immersion in water, the next problem is general body cooling (hypothermia). There are ways that you can protect yourself against these dangers. You will be taught these techniques during this course.

Survival Factors

Your survival will depend on a number of factors, but the three key factors are:

1. Equipment - Do you know where to find all the survival equipment on your vessel? Rough weather and darkness can be very disorientating. This makes it difficult to find your way around, so make a mental note of where the equipment is and where the exits are. Make sure you check the muster list on your vessel so that you know what your duties are in an emergency situation.
2. Knowledge - Know where your lifejacket is and know how to put it on. You should also know how to launch and board an inflatable life raft and know what type of equipment is available in the life raft.
3. Will to survive - This is very important. Without the right mental attitude to face up to the situation you find yourself in, you will not survive. You must stay calm and help others. You must maintain your will to survive at all times.

Never give up

During disaster situations the following generally happens:

- 25% of people will panic
- 25% of people will immediately take active measures to survive
- 50% of people will be paralyzed to inactivity

When you are joining a vessel for the first time check the following:

- Check locations of SOLAS lifejackets and survival suits
- Try on your lifejacket; there are many different types

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• Check the muster list and find your station for an emergency situation
• Examine the inflatable life rafts to see if they have been serviced
• Check that the life rafts have Hydrostatic Release Units
(HRUs) fitted and that they are in date
• Know where the EPIRB is stowed
• Know where the SARTs and Flares are kept
• Ask a question if you are unsure of anything.

Loss of Life at Sea

During World War II, of the 45,000 Royal Navy personnel lost at sea, about 30,000 successfully escaped the sinking ship only to die from drowning or hypothermia. Cold water was the main killer. ***Water takes away body heat 25 times faster than air at the same temperature.*** You are not totally helpless if you have knowledge of survival techniques and the will to survive.

Definitions

For the purpose of this chapter, unless expressly provided otherwise:

1. **Anti-exposure suit** is a protective suit designed for use by rescue boat crews and marine evacuation system parties.
2. **Certificated person** is a person who holds a certificate of proficiency in survival craft under the authority of, or recognized as valid by, the Administration in accordance with the requirements of the International Convention on Standards of Training, Certification and Watch keeping for Seafarers, in force; or a person who holds a certificate issued or recognized by the Administration of a State not a Party to that Convention for the same purpose as the convention certificate.
3. **Detection** is the determination of the location of survivors or survival craft.
4. **Embarkation ladder** is the ladder provided at survival craft embarkation stations to permit safe access to survival craft after landing.
5. **Float-free launching** is that method of launching a survival craft whereby the craft is automatically released from a sinking ship and is ready for use.
6. **Free-fall launching** is that method of launching a survival craft whereby the craft with its complement of persons and equipment on board is released and allowed to fall into the sea without any restraining apparatus.
7. **Immersion suit** is a protective suit which reduces the body heat loss of a person wearing it in cold water. *In Danish ships, immersion suits shall be of a type with built-in insulation and buoyancy.*
8. **Inflatable appliances** is an appliance which depends upon non-rigid, gas-filled chambers for buoyancy and which is normally kept uninflated until ready for use.
9. **Inflated appliances** is an appliance which depends upon no rigid, gas-filled chambers for buoyancy and which is kept inflated and ready for use at all

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times.

10. **International Life-Saving Appliance (LSA) Code** (referred to as "the Code" in this chapter) means the International Life- Saving Appliance (LSA) Code adopted by the Maritime Safety Committee of the Organization by resolution MSC.48(66), as it may be amended by the Organization, provided that such amendments are adopted, brought into force and take effect in accordance with the provisions of article VIII of the present Convention concerning the amendment procedures applicable to the annex other than chapter I.
11. **Launching appliance or arrangement** is a means of transferring a survival craft or rescue boat from its stowed position safely to the water.
12. **Length** is 96% of the total length on a waterline at 85% of the least moulded depth measured from the top of the keel, or the length from the fore-side of the stem to the axis of the rudder stock on that waterline, if that be greater. In ships designed with a rake of keel the waterline on which this is measured shall be parallel to the designed waterline.
13. **Lightest seagoing conditions** is the loading condition with the ship on even keel, without cargo, with 10% stores and fuel remaining and in the case of a passenger ship with the full number of passengers and crew and their luggage.
14. **Marine evacuation systems** is an appliance for the rapid transfer of persons from the embarkation deck of a ship to a floating survival craft.
15. **Novel life-saving appliance or arrangement** is a life-saving appliance or arrangement which embodies new features not fully covered by the provisions of this chapter but which provides an equal or higher standard of safety.
16. **Positive stability** is the ability of a craft to return to its original position after the removal of a heeling moment.
17. **Recovery time** for a rescue boat is the time required to raise the boat to a position where persons on board can disembark to the deck of the ship. Recovery time includes the time required to make preparations for recovery on board the rescue boat such as passing and securing a painter, connecting the rescue boat to the launching appliance, and the time to raise the rescue boat. Recovery time does not include the time needed to lower the launching appliance into position to recover the rescue boat.
18. **Rescue boat** is a boat designed to rescue persons in distress and to marshal survival craft.
19. **Retrieval** is the safe recovery of survivors.
20. **Survival craft** is a craft capable of sustaining the lives of persons in distress from the time of abandoning the ship.
21. **Thermal protective aid** is a bag or suit made of waterproof material with low thermal conductance which complies with the provisions of regulation 34."

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SOLAS training manual

SOLAS Chapter III requires that all ships should be provided with a SOLAS Training Manual / Safety Training Manual detailing all training on the safety aspects of the ship. Scope of this plan is to provide guidance on the use of all the lifesaving appliances onboard. Plan is developed in line with IMO Requirements and common marine practice. Approval by the Administration or a Recognized Organization (RO) on behalf of the Administration is NOT mandatory; however manual subject to PSC inspection is always.

Indicative contents

- SOLAS Requirements
- Personal Life Saving Equipment
- Muster List and Emergency Instructions
- Life Boats and Rescue Boats
- Survival Equipment
- Exposure Hazards
- Use of Survival Craft
- Methods of Retrieval
- Emergency Repair of Life Saving Appliances
- Safety Equipment Inventory

Info/Plans Required

- Ship Specific Information (Questionnaire to be submitted)

Benefits

- Master will have a guidance with respect to SOLAS requirements for training in safety items
- Procedures as per vessel specific arrangements
- Detailed instructions for every step of training
- Updated with latest requirements and legislation
- Already inspected by most MoU's PSC Officers and inspector surveyors

We will ensure

- Full compliance with national and international regulations and common marine practice
- Real life documentation addressed to senior officers and crew onboard

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- Full integration of any client specific requirements
- Full support provided after development in line with our Document Support Policy

IMO SYMBOLS AND SAFETY SIGNS

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Chapter 2

Emergency Situation

Whenever some incident of a serious or harmful nature happens suddenly, we classify it as an emergency. One of the most important factors in dealing with an emergency situation, apart from a sharp mind and the control of respectful fear, is the presence of a solid action plan. This is a general rule that is applicable to all situations whether on board a ship in the middle of the ocean or in a crowded city port amidst a sea of people and machinery.
Emergency situations on a ship tend to be more critical because ships are isolated, solitary floating objects moving in the vast and deep oceans. Since there are so many possible types of emergencies, it is necessary to know about both common and emergency essentials.

Here we will take a look at the general procedures and plans to be followed in case of an emergency situation on board a ship.

Types of Emergencies

For effective usage of the limited emergency equipment available on board, all personnel must be aware of the location of firefighting gear and lifesaving appliances and be trained in their use. They must also be aware of the alarm signals, recognize them, and muster at the muster point in case of any type of emergency.

The general alarm will be sounded in the event of:

- Fire
- Collision
- Grounding
- Cargo hose burst
- Major leakage or spillage of oil cargo
- Any other event which calls for emergency action

Alarms could include:

- Engineer alarm for unmanned machinery spaces
- Carbon dioxide alarm
- Fire detector alarms
- Cargo tank level alarms
- Refrigerated store alarm

If your ship's alarms are ringing, it does not necessarily mean that the situation is out of control. Alarms are warnings, which are sounded so that people onboard take the emergency measures like wearing their life jackets, or gathering at a

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common point, depending upon the type of emergency and instructions given to them.

Structure and Function of Emergency Response Teams

The basic structure of any emergency team will usually comprise four sub-groups.

- The Command Center
- The Emergency Team
- The Back Up Squad
- The Technical Team

Functions of Emergency Team groups:

- The Command Center

  The command center will be located on bridge. The master is to take responsibility for the overall safety and navigation of the ship. All communications will be performed from here to the different teams as well as shore. A log must be maintained of all events.

- The Emergency Team

  The Emergency Team will have the front line job of tackling the emergency. In general the chief officer will lead the team for the emergency on deck while the 2nd engineer will take charge for engine room emergencies. The duties of each person will have to be laid down and practiced for every emergency so as to avoid duplication, confusion, and chaos.

- The Support Team

  The Support Team is to provide first aid and prepare the lifeboats for lowering. Should the above two function not be required, they should assist as directed.

- The Technical Team

  The Technical, or Engineer's, Team will maintain the propulsion and maneuvering capability of the ship and auxiliary services as far as is possible in the circumstances.

General Guidelines for Emergency Response

All members of the technical staff must know all the ship emergency codes in detail. All members of the crew should receive appropriate training in accordance with their role at the time of emergency. Mr. Skylight, Mr. Mob, Code Blue, and Oscar are some of the ship emergency codes followed by mariners.

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On board passengers must be told about the possible dangers because otherwise the general public starts panicking.

An understanding of the effects on the behavior of the ship of wind, current, shallow water, banks, and narrow channels is equally important so that the technical staff does the wise thing at the time of emergency. Closing of the watertight doors, fire doors, valves, scuppers, side-scuttles, skylights, portholes, and other similar openings in the ship is very important so that ocean water does not enter inside the ship.

In case of abandoning the ship, all the passengers must be rescued first using life jackets and life boats, or shifting them to another ship. The staff members should be the last ones to leave the ship and that even only after ensuring that no one is left on the abandoned ship. Modern ships are equipped with hi-tech and advanced life saving tools and with the help of mobile communication devices, or can easily contact off-shore rescue teams.

Crew expertise and initial familiarization

New crew members joining a ship must be familiarized with their duties and important information about the ship. This is to ensure that the new people onboard ship understand their responsibilities thoroughly before commencing their duties. It is the duty of the master of the ship to ensure that each new crew member is given proper familiarization training to ensure personal safety and well-being of the ship. The master would designate a qualified person in charge of training the new crew members of the ship.

Though all crew personnel joining the ship have to do STCW training, there are several specific instructions, which are important for safe operations on ships.

The main aim of the familiarization training is to make the new crew aware of important safety procedures that are to be carried out on ships while working or during emergency situations. It is the duty of the officer in charge of the training to train the new crew regarding:

- Instructions on SOLAS and MARPOL
- Important features of muster list
- Guidelines on how to tackle all kinds of emergency situations on ships
- Important documents and publications of ships
- Ship's Fire Control Plan
- Different types of fire fighting appliances and procedures to use them

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Apart from the above mentioned points, the officer must also ensure that the new crew members know the following:

- Location of life jackets and immersion suits, along with the procedure to wear the life jacket
- Location of escape routes
- Actions for man overboard situation
- Different types of alarms on board ship
- Location of his or her cabin, along with the location of the nearest escape route and fire extinguisher
- Procedure for abandon ship alarm
- His or her duties in the muster list and during emergency situations
- Basics of fire prevention on ships
- Actions to be taken in case of medical emergency before further medical assistance is received
- Operation of fire and water-tight doors fitted on ships
- Important instructions on various drills on ships
- Procedure to operate fire extinguishers
- Procedure to raise an alarm in case of an accident or emergency

Familiarization of duties

- It is a normal procedure on board ships that the new crew member will be given familiarization of his or her duties by the person who is being relieved.

The familiarization training will include:

- Duties to be performed by the new crew member
- Specific equipment to be operated and maintained
- Ship specific watch keeping duties
- Any particular instruction regarding machinery or ship parts which the new crew member should know
- If the new member belongs to the deck side, he or she will be familiarized with navigation equipment , GMDSS , steering system, mooring equipment, cargo handling equipment etc.
- If the new member belongs to the engine side, he or she will be familiarized with the designated machinery, maintenance procedures, and watch keeping procedures

Apart from the watch keeping procedure at sea and at port, the new crew members

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would also be briefed about any standing orders from the chief engineer or captain.

Other Safety Instructions

Apart from duty and safety instructions, the officer in charge of the familiarization training would instruct the new crew member regarding important issues such as

- Garbage management plan and how to handle garbage on ships
- Oil pollution prevention plan
- Ship Security Plan
- Ballast water management plan
- Life boat release procedure
- Life raft release procedure
- Use of maritime distress signals and flares

It is to note that training on life saving appliances and fire fighting appliances must be completed as soon as possible and not later than 2 weeks after joining the ship.

Muster list and emergency signals

(1) The general emergency alarm system shall be capable of sounding **the general alarm signal consisting of seven or more short blasts followed by one long blast on the vessel's whistle or siren and additionally on an electrically operated bell or klaxon** or other equivalent warning system which shall be powered from the vessel's main supply and the emergency source of electrical power required by regulation IV/17.

(2) All vessels shall be provided with clear instructions for each crew member, which shall be followed in case of emergency.

(3) The muster list shall be posted up in several parts of the vessel and, in particular, in the wheelhouse, the engine room and in the crew accommodation and shall include the information specified in the following paragraphs.

(4) The muster list shall specify details of the general alarm signal prescribed by paragraph (1) and also the action to be taken by the crew when this alarm is sounded. The muster list shall also specify how the order to abandon ship will be

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given.

(5) The muster list shall show the duties assigned to the different members of the crew including:

(a) closing of watertight doors, fire doors, valves, scuppers, overboard shoots, side scuttles, skylights, portholes and other similar openings in the vessel;

(b) Equipping the survival craft and other life-saving appliances;

(c) Preparation and launching of survival craft;

(d) General preparation of other life-saving appliances;

(e) Use of communication equipment; and

(f) Manning of fire parties assigned to deal with fires.

(6) The muster list shall specify which officers are assigned to ensure that the life-saving and fire appliances are maintained in good condition and are ready for immediate use.

(7) The muster list shall specify substitutes for key persons who may become disabled, taking into account that different emergencies may call for different actions.

(8) The muster list shall be prepared before the vessel proceeds to sea. After the muster list has been prepared, if any change takes place in the crew, which necessitates an alteration in the muster list, the skipper shall either revise the list or prepare a new list.

Crew and emergency instructions

It may deem necessary to ensure that crews are adequately trained in their duties in the event of emergencies. Such training shall include, as appropriate:

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(a) Types of emergencies which may occur, such as collisions, fire and foundering;

(b) Types of life-saving appliances normally carried on vessels;

(c) Need to adhere to the principles of survival;

(d) Value of training and drills;

(e) Need to be ready for any emergency and to be constantly aware of:

(i) The information in the muster list, in particular:

- Each crew member's specific duties in any emergency;
- Each crew member's own survival station; and
- The signals calling the crew to their survival craft or fire stations;

(ii) Location of each crew member's own lifejacket and spare lifejackets;

(iii) Location of fire alarm controls;

(iv) Means of escape;

(v) Consequences of panic;

(f) Actions to be taken in respect to lifting persons from vessels and survival craft by helicopter;

(g) Actions to be taken when called to survival craft stations, including:

(i) Putting on suitable clothing;

(ii) Donning of lifejacket; and

(iii) Collecting additional protection such as blankets, time permitting;

(h) Actions to be taken when required abandoning ship, such as:

(i) How to board survival craft from vessel and water; and

(ii) How to jump into the sea from a height and reduce the risk of injury

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when entering the water;

(i) Actions to be taken when in the water, such as:

(i) How to survive in circumstances of

- Fire or oil on the water;

- Cold conditions; and

-Shark-infested waters;

(ii) How to right a capsized survival craft;

(j) Actions to be taken when aboard a survival craft, such as:

(i) Getting the survival craft quickly clear of the vessel;

(ii) Protection against cold or extreme heat;

(iii) Using a drogue or sea-anchor;

(iv) Keeping a look-out;

(v) Recovering and caring for survivors;

(vi) Facilitating detection by others;

(vii) Checking equipment available for use in the survival craft and using it correctly; and

(viii) Remaining, so far as possible, in the vicinity;

(k) Main dangers to survivors and the general principles of survival, including:

(i) Precautions to be taken in cold climates;

(ii) Precautions to be taken in tropical climates;

(iii) Exposure to sun, wind, rain and sea;

(iv) Importance of wearing suitable clothing;

(v) Protective measures in survival craft;

(vi) Effects of immersion in the water and of hypothermia;

(vii) Importance of preserving body fluids;

(viii) Protection against seasickness;

(ix) Proper use of fresh water and food;

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(x) Effects of drinking seawater;

(xi) Means available for facilitating detection by others; and

(xii) Importance of maintaining morale;

(l) Actions to be taken in respect to fire fighting:

(i) The use of fire hoses with different nozzles;

(ii) The use of fire extinguishers;

(iii) Knowledge of the location of fire doors; and

(iv) The use of breathing apparatus.

Extra equipment

Extra blanket, packed food, extra water can be carried if time permits.

Abandon ship complication

1. Inadequate training in survival methods.
2. Carelessness of the individual.
3. Ignorance.
4. Giving up too soon or managing too poorly.
5. Unpreparedness.
6. Abandoning the Ship in Cold Climate

a) Clothing:

1) Long woolen underwear and woolen socks to keep body warm.

2) Wind proof jacket to protect shoulder and arms.

3) Helmet or watch cap to keep head warm and water out.

4) Garments that can be slipped off easily.

5) Gloves to keep hands warm and to prevent burning them on lines.

b) What to Take:

1) Flashlight with a transparent rubber water sheath or pin on flashlight.

2) Police whistle.

3) Knife.

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4) A six foot line tied under arm with a snap on free end to secure self to line one rescuing

ship.

5) Wallet and money belt

c) Actions before leaving the ship:

1) If possible, drink hot tea or coffee to ward off effect of cold water.

2) Test lifejacket valves and inflating tubes.

3) Stimulate circulation by deep and rapid breathing and by flexing arms and knees, to not

over exert.

7. Abandoning ship in Hot Climate:

a) Wear a shirt, trouser and tennis shoes to protect you from the effect of sun and salt

water.

b) Take the same articles with you and follow the same routine before leaving ship as

described for abandoning ship in cold climate.

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Chapter 3
Evacuation

Abandoning ship last resort

Abandoning ship should be the last resort, reserved for when the ship is sinking or there is a serious fire.
Resist the temptation to get off the boat simply because you are seasick or miserable. No matter how bad the situation may seem, the boat often survives. Crewmembers could be in more danger if they abandon the boat than if they stay on board.

Personal preparation for abandoning ship

In the event you have to abandon ship, the following actions, amongst others, must be taken:

- Sound general alarm
- Follow muster alarm list

1. Each crewmember should have their lifejacket on

2. Each crewmember should immediately join his emergency station to prepare the lifeboats or to start to clear away the inflatable life rafts.

- The responsible officers employed on damage control duty should report regularly to the master
- Update vessel's position, in radio room, Satellite terminal and other automatic distress transmitters (GMDSS)
- Send distress message / alert other vessels
- Check if all crewmembers and passengers (if any) are present
- Search for missing personnel (especially in the engine room and at night in accommodations)
- Activate EPIRB's
- Manoeuvre vessel in proper position / stop engine
- If possible, prepare ship's documents (especially the log book)
- After rescue, inform company

Need to prevent panic

A panic attack is a condition of adrenaline being released into your bloodstream. A message of fear sends a signal to the adrenal glands that there is an emergency.

The adrenal glands are pea-sized organs that sit on top of your kidneys. They are

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filled with adrenaline that, when released into your body, gives you heightened abilities to respond to emergency situations. This emergency response causes physical symptoms that many people misinterpret as a heart attack or other serious physical conditions. Misinterpreting these symptoms can cause the fear response to continue.

It Only Takes Three Minutes to Stop a Panic Attack - **Learn These Four Simple Steps**

1. Relax.
2. Stop Negative Thinking.
3. Use Coping Statements.
4. Accept Your Feelings.

Crew duties to passengers & launching survival craft

- summoning of passengers to muster stations with the alarm required announcement on the public address or other communication system and ensuring that they are made aware of the order to abandon ship;
- reporting to stations and preparing for the duties described in the muster list;
- checking that passengers are suitably dressed;
- checking that lifejackets are correctly donned;
- lowering survival craft after any necessary preparation for launching;
- starting and operating the lifeboat engine;
- A search and rescue of passengers trapped in their staterooms.

Preparation and handling of survival craft at any one launching station shall not interfere with the prompt preparation and handling of any other survival craft or rescue boat at any other station.

During preparation and launching, each survival craft, its launching appliance, and the area of water into which it is to be launched shall be adequately illuminated by lighting supplied from the emergency source of electrical power.

Master's orders to abandon ship

NO SHIP IS ABANDONED EXCEPT BY ORDER OF THE MASTER

The order "ABANDON SHIP" will be done ONLY by master or his deputy and ABANDON signal MUST always be confirmed by word from the Master.

Means of Survival

Survival is defined as the ability to stay alive when life is threatened after shipwreck by

• Fire

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- Explosion
- Collision
- Grounding
- Man overboard ('MOB').

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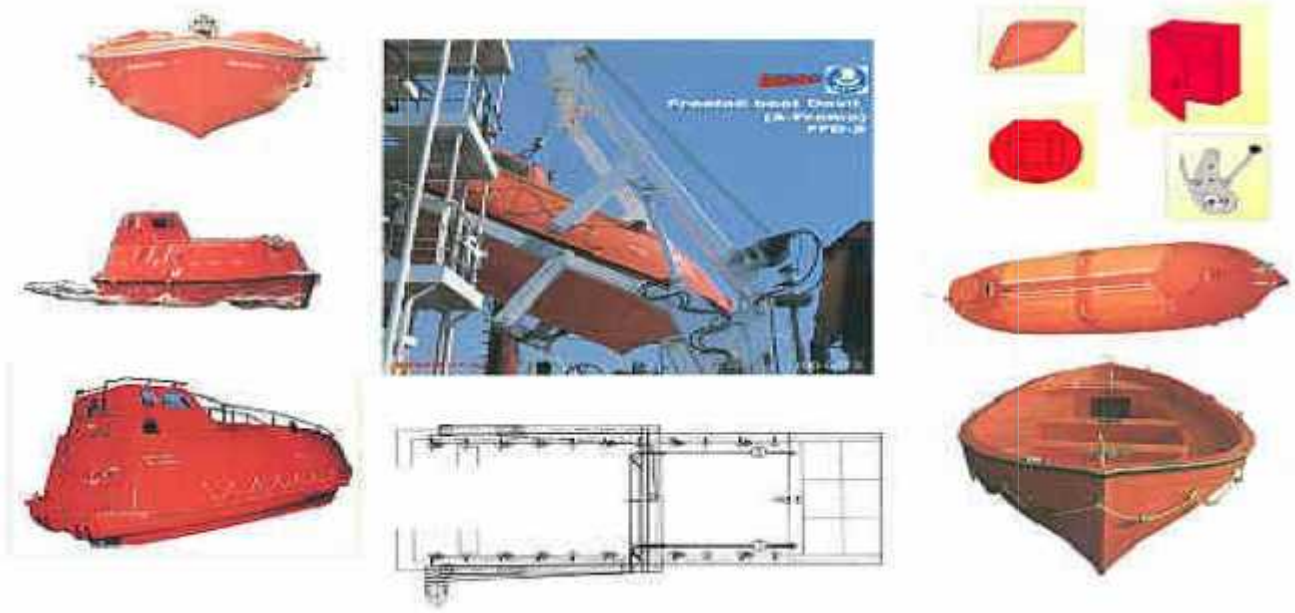
Chapter 4

Survival Craft and Rescue Boat



All lifeboats shall be properly constructed and shall be of such form and proportions that they have ample stability in a seaway and sufficient freeboard when loaded with their full complement of persons and equipment. All lifeboats shall have rigid hulls and shall be capable of maintaining positive stability when in an upright position in calm water and loaded with their full complement of persons and equipment and holed in any one location below the waterline, assuming no loss of buoyancy material and no other damage.
Each lifeboat shall be fitted with a certificate of approval, endorsed by the Administration, containing at least the following items:

- manufacturer's name and address;
- lifeboat model and serial number;
- month and year of manufacture;
- number of persons the lifeboat is approved to carry; and
- With approval information including the Administration which approved it, and any operational restrictions.

The certifying organization shall provide the lifeboat with a certificate of approval which, in addition to the above items, specifies:

- number of the certificate of approval;
- material of hull construction, in such detail as to ensure that compatibility

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problems in repair should not occur;
- total mass fully equipped and fully manned;
- Statement of approval.

All lifeboats shall be of sufficient strength to:
- Enable them to be safely launched into the water when loaded with their full complement of persons and equipment;
- Be capable of being launched and towed when the ship is making headway at a speed of 5 knots in calm water.

Hulls and rigid covers shall be fire-retardant or non-combustible.

Seating shall be provided on thwarts, benches or fixed chairs which are constructed so as to be capable of supporting:
- A static load equivalent to the number of persons each weighing 100 kg for which spaces are provided in compliance with the seating requirements shown on above *Figure.*
- A load of 100 kg in any single seat location when a lifeboat to be launched by falls is dropped into the water from a height of at least 3 m;
- A load of 100 kg in any single seat location when a free-fall lifeboat is launched from a height of at least 1.3 times its free-fall certification height.

Except for free-fall lifeboats, each lifeboat to be launched by falls shall be of sufficient strength to withstand a load, without residual deflection on removal of that load:
- in the case of boats with metal hulls, 1.25 times the total mass of the lifeboat when loaded with its full complement of persons and equipment; or
- in the case of other boats, twice the total mass of the lifeboat when loaded with its full complement of persons and equipment.

Except for free-fall lifeboats, each lifeboat to be launched by falls shall be of sufficient strength to withstand, when loaded with its full complement of persons and equipment and with, where applicable, skates or fenders in position, a lateral impact against the ship's side at an impact velocity of at least 3.5 m/s and also a drop into the water from a height of at least 3 m.

The vertical distance between the floor surface and the interior of the enclosure or canopy over 50% of the floor area shall be:
- not less than 1.3 m for a lifeboat permitted to accommodate nine persons or less;
- not less than 1.7 m for a lifeboat permitted to accommodate 24 persons or more; and

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- not less than the distance as determined by linear interpolation between 1.3 m and 1.7 m for a lifeboat permitted to
- Accommodate between nine and 24 persons.

No lifeboat shall be approved to accommodate more than 150 persons.

The number of persons which a lifeboat to be launched by falls shall be permitted to accommodate shall be equal to the lesser of:

- The number of persons having an average mass of 75 kg, all wearing lifejackets, that can be seated in a normal position without interfering with the means of propulsion or the operation of any of the lifeboat's equipment; or
- The number of spaces that can be provided on the seating arrangements in accordance with figure (below). The shapes may be overlapped as shown, provided footrests are fitted and there is sufficient room for legs and the vertical separation between the upper and lower seat is not less than 350 mm.

Each seating position shall be clearly indicated in the lifeboat.

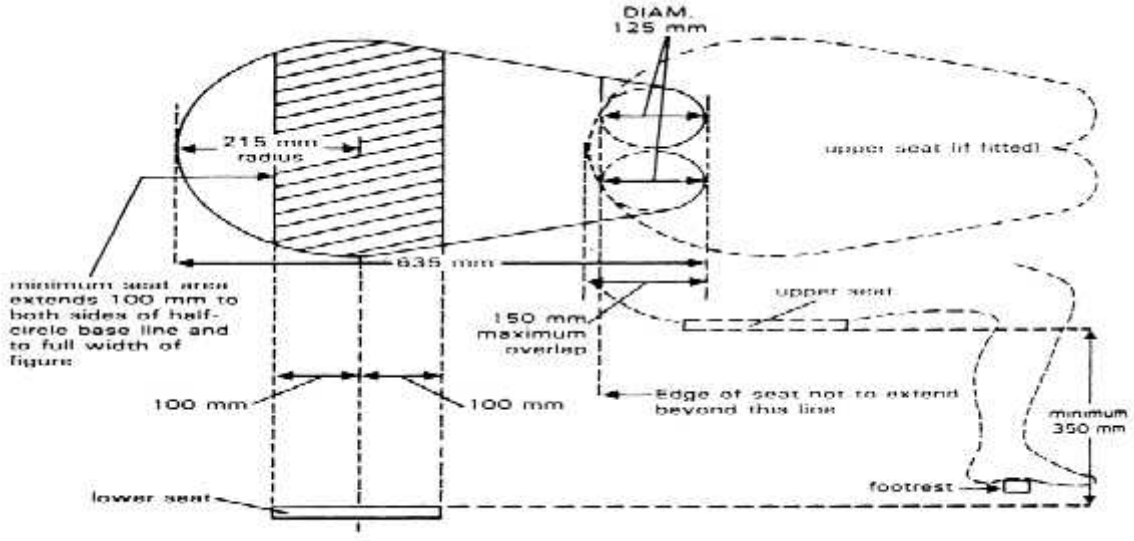

Figure 1

Access into lifeboats

- Every passenger ship lifeboat shall be so arranged that it can be rapidly boarded by its full complement of persons. Rapid disembarkation shall also be possible.
- Every cargo ship lifeboat shall be so arranged that it can be boarded by its full complement of persons in not more than 3 min from the time the

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instruction to board is given. Rapid disembarkation shall also be possible.

- Lifeboats shall have a boarding ladder that can be used at any boarding entrance of the lifeboat to enable persons in the water to board the lifeboat. The lowest step of the ladder shall be not less than 0.4 m below the lifeboat's light waterline.
- The lifeboat shall be so arranged that helpless people can be brought on board either from the sea or on stretchers.
- All surfaces on which persons might walk shall have a non-skid finish.

Lifeboat buoyancy

All lifeboats shall have inherent buoyancy or shall be fitted with inherently buoyant material which shall not be adversely affected by seawater, oil or oil products, sufficient to float the lifeboat with all its equipment on board when flooded and open to the sea. Additional inherently buoyant material, equal to 280 N of buoyant force per person shall be provided for the number of persons the lifeboat is permitted to accommodate. Buoyant material, unless in addition to that required above, shall not be installed external to the hull of the lifeboat.

Lifeboat freeboard and stability

All lifeboats shall be stable and have a positive GM value when loaded with 50% of the number of persons the lifeboat is permitted to accommodate in their normal positions to one side of the centerline.

Under the condition of loading described above:

- each lifeboat with side openings near the gunwale shall have a freeboard, measured from the waterline to the lowest opening through which the lifeboat may become flooded, of at least 1.5% of the lifeboat's length or 100 mm, whichever is the greater;
- each lifeboat without side openings near the gunwale shall not exceed an angle of heel of 20° and shall have a freeboard, measured from the waterline to the lowest opening through which the lifeboat may become flooded, of at least 1.5% of the lifeboat's length or 100 mm, whichever is the greater.

Lifeboat propulsion

Every lifeboat shall be powered by a compression ignition engine. No engine shall be used for any lifeboat if its fuel has a flashpoint of43°C or less (closed cup test). The engine shall be provided with either a manual starting system, or a power starting system with two independent rechargeable energy sources. Any necessary starting aids shall also be provided. The engine starting systems and starting aids shall start the engine at an ambient temperature of -15°C within 2 min of commencing the start procedure unless, in the opinion of the Administration having regard to the particular voyages in which the ship carrying the lifeboat is constantly engaged, a different temperature is appropriate.

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The starting systems shall not be impeded by the engine casing, seating or other obstructions.
The speed of a lifeboat when proceeding ahead in calm water, when loaded with its full complement of persons and equipment and with all engine powered auxiliary equipment in operation, shall be at least 6 knots and at least 2 knots when towing a 25-person life-raft loaded with its full complement of persons and equipment or its equivalent. Sufficient fuel, suitable for use throughout the temperature range expected in the area in which the ship operates, shall be provided to run the fully loaded lifeboat at 6 knots for a period of not less than 24 h. Water-resistant instructions for starting and operating the engine shall be provided and mounted in a conspicuous place near the engine starting controls.

Lifeboat fittings

All lifeboats except free-fall lifeboats shall be provided with at least one drain valve fitted near the lowest point in the hull, which shall automatically open to drain water from the hull when the lifeboat is not waterborne and shall automatically close to prevent entry of water when the lifeboat is waterborne. Each drain valve shall be provided with a cap or plug to close the valve, which shall be attached to the lifeboat by a lanyard, a chain, or other suitable means. Drain valves shall be readily accessible from inside the lifeboat and their position shall be clearly indicated.
All lifeboats shall be provided with a rudder and tiller. The rudder shall be permanently attached to the lifeboat.
All lifeboats shall be fitted with sufficient watertight lockers or compartments to provide for the storage of the small items of equipment, water and provisions.
Every lifeboat to be launched by a fall or falls, except a free-fall lifeboat, shall be fitted with a release mechanism, which shall be so arranged that all hooks are released simultaneously and release control shall be clearly marked in a color that contrasts with its surroundings.
Every lifeboat shall be fitted with a device to secure a painter near its bow. The device shall be such that the lifeboat does not exhibit unsafe or unstable characteristics when being towed by the ship making headway at speeds up to 5 knots in calm water.
Except for free-fall lifeboats, the painter securing device shall include a release device to enable the painter to be released from inside the lifeboat, with the ship making headway at speeds up to 5 knots in calm water. Every lifeboat shall be so arranged that an adequate view forward, aft and to both sides is provided from the control and steering position for safe launching and maneuvering.

Lifeboat equipment

1) Except for free-fall lifeboats, sufficient buoyant oars to make headway in calm

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seas.
2) Two boat-hooks;
3) A buoyant bailer and two buckets;
4) A survival manual
5) An operational compass which is luminous or provided with suitable means of illumination. In a totally enclosed lifeboat, the compass shall be permanently fitted at the steering position; in any other lifeboat, it shall be provided with a binnacle if necessary to protect it from the weather, and suitable mounting arrangements;
6) A sea-anchor of adequate size fitted with a shock-resistant hawser which provides a firm hand grip when wet. The strength of the sea-anchor, hawser and tripping line if fitted shall be adequate for all sea conditions;
7) Two efficient painters of a length equal to not less than twice the distance from the stowage position of the lifeboat to the waterline in the lightest seagoing condition or 15 m, whichever is the greater. On lifeboats to be launched by free-fall launching, both painters shall be stowed near the bow ready for use. On other lifeboats, one painter attached to the release Device required to come together with release mechanism shall be placed at the forward end of the lifeboat and the other shall be firmly secured at or near the bow of the lifeboat ready for use;
8) Two hatchets, one at each end of the lifeboat;
9) watertight receptacles containing a total of 3 liters of fresh water for each person the lifeboat is permitted to accommodate, of which either 1 liter per person may be replaced by a desalting apparatus capable of producing an equal amount of fresh water in 2 days, or 2 liters per person may be replaced by a manually powered reverse osmosis desalinator capable of producing an
equal amount of fresh water in 2 days;
10) A rustproof dipper with lanyard;
11) A rustproof graduated drinking vessel;
12) A food ration totaling not less than 10,000 kJ for each person the lifeboat is permitted to accommodate; these rations shall be kept in airtight packaging and be stowed in a watertight container;
13) Four rocket parachute flares;
14) Six hand flares;
15) Two buoyant smoke signals;
16) One waterproof electric torch suitable for Morse signaling together with one spare set of batteries and one spare bulb in a waterproof container;
17) One daylight signaling mirror with instructions for its use for signaling to ships and aircraft;
18) One copy of the life-saving signals prescribed by regulation V/16 on a waterproof card or in a waterproof container;
19) One whistle or equivalent sound signal;
20) A first-aid outfit in a waterproof case capable of being closed tightly after use;
21) Anti-seasickness medicine sufficient for at least 48 h and one seasickness bag for each person;

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22) A jack-knife to be kept attached to the boat by a lanyard;
23) Three tin openers;
24) Two buoyant rescue quoits, attached to not less than 30 m of buoyant line;
25) If the lifeboat is not automatically self-bailing, a manual pump suitable for effective bailing;
26) One set of fishing tackle;
27) Sufficient tools for minor adjustments to the engine and its accessories;
28) Portable fire-extinguishing equipment of an approved type suitable for extinguishing oil fires [A.602(15)].
29) a searchlight with a horizontal and vertical sector of at least 6° and a measured luminous intensity of 2500 cd which can work continuously for not less than 3 h;
30) An efficient radar reflector, unless a survival craft radar transponder is stowed in the lifeboat;
31) Thermal protective aids complying with the requirements of section 2.5 sufficient for 10% of the number of persons the lifeboat is permitted to accommodate or two, whichever is the greater;
32) In the case of ships engaged on voyages of such a nature and duration that, in the opinion of the Administration a food ration and fishing tackle are unnecessary, the Administration may allow these items to be dispensed with.

Lifeboat markings

- The number of persons for which the lifeboat is approved shall be clearly marked on it in clear permanent characters.
- The name and port of registry of the ship to which the lifeboat belongs shall be marked on each side of the lifeboat's bow in block capitals of the Roman alphabet.
- Means of identifying the ship to which the lifeboat belongs and the number of the lifeboat shall be marked in such a way that they are visible from above.

Free-fall lifeboats

Free-fall lifeboats shall comply with the requirements of totally enclosed lifeboats described above. The carrying capacity of a free-fall lifeboat is the number of persons that can be provided with a seat without interfering with the means of propulsion or the operation of any of the lifeboat's equipment. The width of the seat shall be at least 430 mm. Free clearance in front of the backrest shall be at least 635 mm. The backrest shall extend at least 1,000 mm above the seat pan. Each free-fall lifeboat shall make positive headway immediately after water entry and shall not come into contact with the ship after a free-fall launching against a trim of up to 10° and a list of up to 20° either way from the certification height when fully equipped and loaded with:

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- its full complement of persons;
- occupants so as to cause the centre of gravity to be in the most forward position;
- occupants so as to cause the centre of gravity to be in the most aft position;
- its operating crew only.

Each free-fall lifeboat shall be of sufficient strength to withstand, when loaded with its full complement of persons and equipment, a free-fall launch from a height of at least 1.3 times the free-fall certification height.

Each free-fall lifeboat shall be fitted with a release system which shall:

- have two independent activation systems for the release mechanisms which may only be operated from inside the lifeboat and be marked in a color that contrasts with its surroundings;
- be so arranged as to release the boat under any condition of loading from no load up to at least 200% of the normal load caused by the fully equipped lifeboat when loaded with the number of persons for which it is to be approved;
- be adequately protected against accidental or premature use;
- be designed to test the release system without launching the lifeboat;
- be designed with a factor of safety of 6 based on the ultimate strength of the materials used.

In addition to the requirements for fully enclosed lifeboat certificate of approval for a free-fall lifeboat shall also state:

- free-fall certification height;
- required launching ramp length; and
- launching ramp angle for the free-fall certification height.

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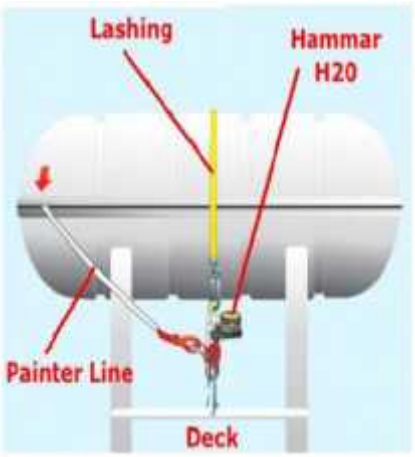
LIFE RAFTS

Every liferaft shall be so constructed as to be capable of withstanding exposure for 30 days afloat in all sea conditions. The liferaft shall be so constructed that when it is dropped into the water from a height of 18 m, the liferaft and its equipment will operate satisfactorily. If the liferaft is to be stowed at a height of more than 18 m above the waterline in the lightest seagoing condition, it shall be of a type which has been satisfactorily drop-tested from at least that height.

The floating liferaft shall be capable of withstanding repeated jumps on to it from a height of at least 4.5 m above its floor both with and without the canopy erected. The liferaft and its fittings shall be so constructed as to enable it to be towed at a speed of 3 knots in calm water when loaded with its full complement of persons and equipment and with one of its sea-anchors streamed.



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The liferaft shall have a canopy to protect the occupants from exposure which is automatically set in place when the liferaft is launched and waterborne.
No liferaft shall be approved which has a carrying capacity of less than six persons.
Unless the liferaft is to be launched by an approved launching appliance or is not required to be stowed in a position providing for easy side-to-side transfer, the total mass of the liferaft, its container and its equipment shall not be more than 185 kg.
The liferaft shall be fitted with an efficient painter of length equal to not less than 10 m plus the distance from the stowed position to the waterline in the lightest seagoing condition or 15 m whichever is the greater.
In addition to the above requirements, a liferaft for use with an approved launching appliance shall:

- when the liferaft is loaded with its full complement of persons and equipment, be capable of withstanding a lateral impact against the ship's side at an impact velocity of not less than 3.5 m/s and also a drop into the water from a height of not less than 3 m without damage that will affect its function;
- Be provided with means for bringing the liferaft alongside the embarkation deck and holding it securely during embarkation.

Every passenger ship davit-launched liferaft shall be so arranged that it can be rapidly boarded by its full complement of persons.
Every cargo ship davit-launched liferaft shall be so arranged that it can be boarded by its full complement of persons in not more than 3 min from the time the instruction to board is given.

The marking required on liferafts equipped in accordance with LSA code regulation 4.1.5.1 shall be "SOLAS A PACK" in block capitals of the Roman alphabet.
In the case of passenger ships engaged on short international voyages of such a nature and duration that, in the opinion of the
Administration, not all the items specified in paragraph 4.1.5.1 are necessary, and "SOLAS B PACK" should be marked in block
capitals of the Roman alphabet on liferaft.
The liferaft painter system shall provide a connection between the ship and the liferaft and shall be so arranged as to ensure that the liferaft when released and, in the case of an inflatable liferaft, inflated is not dragged under by the sinking ship.

If a weak link is used in the float-free arrangement, it shall:

- not be broken by the force required to pull the painter from the liferaft container;
- if applicable, be of sufficient strength to permit the inflation of the liferaft; and
- break under a strain of 2.2 ± 0.4 kN.

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The liferaft shall be packed in a container that is:

- so constructed as to withstand hard ware under conditions encountered at sea;
- of sufficient inherent buoyancy, when packed with the liferaft and its equipment, to pull the painter from within and to operate
- the inflation mechanism should the ship sink;
- as far as practicable watertight, except for drain holes in the container bottom.

The container shall be marked with:

- maker's name or trade mark;
- serial number;
- name of approving authority and the number of persons it is permitted to carry;
- SOLAS;
- type of emergency pack enclosed;
- date when last serviced;
- length of painter;
- maximum permitted height of stowage above waterline (depending on drop-test height and length of painter);
- launching instructions.

RESCUE BOAT

Rescue boats may be either of rigid or inflated construction or a combination of both and shall:

- be not less than 3.8 m and not more than 8.5 m in length; and
- be capable of carrying at least five seated persons and a person lying on a stretcher.

Rescue boats shall be capable of maneuvering at a speed of at least 6 knots and maintaining that speed for a period of at least 4 hours. Rescue boats shall have sufficient mobility and maneuverability in a seaway to enable persons to be retrieved from the water, marshal liferafts and tow the largest liferaft carried on the ship when loaded with its full complement of persons and equipment or its equivalent at a speed of at least 2 knots. A rescue boat shall be fitted with an inboard engine or outboard motor. If it is fitted with an outboard motor, the rudder and tiller may form part of the engine.

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Arrangements for towing shall be permanently fitted in rescue boats and shall be sufficiently strong to marshal or tow liferafts.
Inflated rescue boats shall be so constructed as to be capable of withstanding exposure:

- when stowed on an open deck on a ship at sea;
- for 30 days afloat in all sea conditions.

The buoyancy of an inflated rescue boat shall be provided by either a single tube subdivided into at least five separate compartments of approximately equal volume or two separate tubes neither exceeding 60% of the total volume.
In addition to complying with the requirements lifeboats, inflated rescue boats shall be marked with a serial number, the maker's name or trade mark and the date of manufacture.
The inflated rescue boat shall be maintained at all times in a fully inflated condition.

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CHAPTER 5
Personal Life Saving Appliances

LIFE BUOYS

Every lifebuoy shall:

- have an outer diameter of not more than 800 mm and an inner diameter of not less than 400 mm; be constructed of inherently buoyant material; it shall not depend upon rushes, cork shavings or granulated cork, any other loose granulated material or any air compartment which depends on inflation for buoyancy;
- be capable of supporting not less than 14.5 kg of iron in fresh water for a period of 24 hours;
- have a mass of not less than 2.5 kg;
- not sustain burning or continue melting after being totally enveloped in a fire for a period of 2 seconds;
- be constructed to withstand a drop into the water from the height at which it is stowed above the waterline in the lightest sea going condition or 30 m, whichever is the greater, without impairing either its operating capability or that of its attached components;
- if it is intended to operate the quick release arrangement provided for the self-activated smoke signals and self-igniting lights, have a mass sufficient to operate the quick release arrangement;
- be fitted with a grab line not less than 9.5 mm in diameter and not less than 4 times the outside diameter of the body of the buoy in length. The grab line shall be secured at four equidistant points around the circumference of the buoy to form four equal loops.

Self-igniting lights shall:

- be such that they cannot be extinguished by water;
- be of white colour and capable of either burning continuously with a

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luminous intensity of not less than 2 cd in all directions of the upper hemisphere or flashing (discharge flashing) at a rate of not less than 50 flashes and not more than 70 flashes per min with at least the corresponding effective luminous intensity;
- be provided with a source of energy capable of meeting the requirement of previous paragraph for a period of at least 2 hours;
- be capable of withstanding the drop test into the water from the height at which it is stowed above the waterline in the lightest seagoing condition or 30 m, whichever is the greater, without impairing either its operating capability or that of its attached components.

Self-activating smoke signals shall:

- emit smoke of a highly visible color at a uniform rate for a period of at least 15 min when floating in calm water;
- not ignite explosively or emit any flame during the entire smoke emission time of the signal;
- not be swamped in a seaway;
- continue to emit smoke when fully submerged in water for a period of at least 10 s;
- be capable of withstanding the drop test into the water from the height at which it is stowed above the waterline in the lightest seagoing condition or 30 m, whichever is the greater, without impairing either its operating capability or that of its attached components.

Buoyant lifelines shall:

- be non-kinking;
- have a diameter of not less than 8 mm; and
- have a breaking strength of not less than 5 kN.

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Life-jackets:

An adult life-jacket shall be so constructed that:

- shall not sustain burning or continue melting after being totally enveloped in a fire for a period of 2 seconds.
- at least 75% of persons, who are completely unfamiliar with the lifejacket, can correctly don it within a period of one min without assistance, guidance or prior demonstration;
- after demonstration, all persons can correctly don it within a period of one minute without assistance;
- it is clearly capable of being worn in only one way or, as far as is practicable, cannot be donned incorrectly;
- it is comfortable to wear;
- it allows the wearer to jump from a height of at least 4.5 m into the water without injury and without dislodging or damaging the lifejacket.
- shall have buoyancy which is not reduced by more than 5% after 24h submersion in fresh water.
- shall be fitted with a whistle firmly secured by a cord

An adult lifejacket shall have sufficient buoyancy and stability in calm fresh water to:

- 1 lift the mouth of an exhausted or unconscious person not less than 120 mm clear of the water with the body inclined backwards at an angle of not less than 20° from the vertical position;
- 2 turn the body of an unconscious person in the water from any position to one where the mouth is clear of the water in not more than 5 s.
- shall allow the person wearing it to swim a short distance and to board a survival craft.

A child lifejacket shall be constructed and perform the same as an adult lifejacket except as follows:

- donning assistance is permitted for small children;
- it shall only be required to lift the mouth of an exhausted or unconscious wearer clear of the water a distance appropriate to the size of the intended wearer;
- assistance may be given to board a survival craft, but wearer mobility shall not be significantly reduced.

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Inflatable lifejackets

A lifejacket which depends on inflation for buoyancy shall have not less than two separate compartments and comply with the all requirements for ordinary lifejacket, and shall:

- inflate automatically on immersion, be provided with a device to permit inflation by a single manual motion and be capable of being inflated by mouth;
- in the event of loss of buoyancy in any one compartment be capable of complying with the all requirements for ordinary lifejacket;
- shall have buoyancy which is not reduced by more than 5% after 24h submersion in fresh water after inflation by means of the automatic mechanism.

Life-jacket light shall:

- have a luminous intensity of not less than 0.75 cd in all directions of the upper hemisphere;
- have a source of energy capable of providing a luminous intensity of 0.75 cd for a period of at least 8 hours;
- be visible over as great a segment of the upper hemisphere as is practicable when attached to a lifejacket;
- be of white color.

If the light referred above is a flashing light it shall, in addition:

- be provided with a manually operated switch; and
- flash at a rate of not less than 50 flashes and not more than 70 flashes per min with an effective luminous intensity of at least0.75 cd.

IMMERSION SUITS, ANTI-EXPOSURE SUITS AND THERMAL PROTECTIVE AIDS

The immersion suit

The immersion suit shall be constructed with waterproof materials such that:

- it can be unpacked and donned without assistance within 2 min, taking into account any associated clothing*, and a lifejacket
- if the immersion suit is to be worn in conjunction with a lifejacket;
- it will not sustain burning or continue melting after being totally enveloped

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in a fire for a period of 2 seconds;

- It will cover the whole body with the exception of the face. Hands shall also be covered unless permanently attached gloves are provided;
- it is provided with arrangements to minimize or reduce free air in the legs of the suit;
- Following a jump from a height of not less than 4.5 m into the water there is no undue ingress of water into the suit.

An immersion suit which also complies with the requirements of life-jackets may be classified as a life-jacket.
An immersion suit which has buoyancy and is designed to be worn without a lifejacket shall be fitted with a light and the whistle complying with the requirements for life-jackets.
If the immersion suit is to be worn in conjunction with a lifejacket, the lifejacket shall be worn over the immersion suit. A person wearing such an immersion suit shall be able to don a lifejacket without assistance.

In that case immersion suit shall permit the person wearing it:

- to climb up and down a vertical ladder at least 5 m in length;
- to perform normal duties associated with abandonment;
- to jump from a height of not less than 4.5 m into the water without damaging or dislodging the immersion suit, or being injured;
- to swim a short distance through the water and board a survival craft.

An immersion suit made of material which has no inherent insulation shall be:
1 marked with instructions that it must be worn in conjunction with warm clothing;
2 so constructed that, when worn in conjunction with warm clothing, and with a lifejacket if the immersion suit is to be worn with a lifejacket, the immersion suit continues to provide sufficient thermal protection, following one jump by the wearer into the water from a height of 4.5 m, to ensure that when it is worn for a period of 1h in calm circulating water at a temperature of 5°C, the wearer's body core temperature does not fall more than 2°C.

An immersion suit made of material with inherent insulation, when worn either on its own or with a lifejacket, if the immersion suit is to be worn in conjunction with

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a lifejacket, shall provide the wearer with sufficient thermal insulation, following one jump into the water from a height of 4.5 m, to ensure that the wearer's body core temperature does not fall more than 2°C after a period of 6h immersion in calm circulating water at a temperature of between 0°C and 2°C.
A person in fresh water wearing either an immersion suit or an immersion suit with a lifejacket, shall be able to turn from a face-down to a face-up position in not more than 5 seconds.

Anti-exposure suits

The anti-exposure suit shall be constructed with waterproof materials such that it:

- provides inherent buoyancy of at least 70 N;
- is made of material which reduces the risk of heat stress during rescue and evacuation
- operations;
- covers the whole body with the exception of the head and hands and, where the Administration so permits, feet; gloves and a
- hood shall be provided in such a manner as to remain available for use with the anti-exposure suits;
- can be unpacked and donned without assistance within 2 min;
- does not sustain burning or continue melting after being totally enveloped in a fire for a period of 2 seconds;
- is equipped with a pocket for a portable VHF telephone;
- has a lateral field of vision of at least 120°.

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An anti-exposure suit which also complies with the requirements of life-jackets may be classified as a life-jacket.

An anti-exposure suit shall permit the person wearing it:

- to climb up and down a vertical ladder of at least 5 m in length;
- to jump from a height of not less than 4.5 m into the water with feet first, without
- damaging or dislodging the suit, or being injured;
- to swim through the water at least 25 m and board a survival craft;
- to don a lifejacket without assistance; and
- to perform all duties associated with abandonment, assist others and operate a
- rescue boat.

An anti-exposure suit shall be fitted with a light complying with the requirements for life jackets. A person in fresh water wearing an anti-exposure suit complying with the requirements of this section shall be able to turn from a facedown to a face-up position in not more than 5 seconds and shall be stable face-up. The suit shall have no tendency to turn the wearer face-down in moderate sea condition.

An anti-exposure suit shall:

- if made of material which has no inherent insulation, be marked with instructions that it must be worn in conjunction with warm clothing;
- be so constructed, that when worn as marked, the suit continues to provide sufficient thermal protection following one jump into the water which totally submerges the wearer and shall ensure that when it is worn in calm circulating water at a temperature of 5°C, the wearer's body core temperature does not fall at a rate of more than 1.5°C per hour, after the first 0.5 hours.

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Thermal protective aids

A thermal protective aid shall be made of waterproof material having a thermal conductance of not more than 7800 W/(m2.K) and shall be so constructed that, when used to enclose a person, it shall reduce both the convective and evaporative heat loss from the wearer's body.

The thermal protective aid shall:

- cover the whole body of persons of all sizes wearing a lifejacket with the exception of the face. Hands shall also be covered unless permanently attached gloves are provided;
- be capable of being unpacked and easily donned without assistance in a survival craft or rescue boat;
- Permit the wearer to remove it in the water in not more than 2 min, if it impairs ability to swim.

The thermal protective aid shall function properly throughout an air temperature range -30°C to +20°C.

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Chapter 6
Personal life saving appliances (demonstration)

Personal life saving appliances training will given to all candidates

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Chapter 7
Survival at sea

Dangers to survivors& Best use of survival craft facilities

The major dangers to survivors at sea are:

- Hypothermia
- Hyperthermia
- Drowning
- Shark attack
- Exhaustion
- Dehydration
- Loss of will to live

Hypothermia

Hypothermia is a condition of low body core temperature. The normal body temperature is 37° C and is regulated by the brain. In a survival situation, there is great body heat loss due to:

- Wet and windy conditions
- Being in water
- A lack of clothing

Hypothermia is also associated with:

- Hunger
- Exhaustion
- Anxiety
- Low morale

The heat loss from wet skin is greater than that from dry skin. This is further increased by a blowing wind. This is called the 'Chill Factor'. The start of hypothermia can be rapid and if it is not stopped, the person can die within an hour.

The victim often does not realize that he or she has hypothermia. Some victims have died without even complaining of the cold.

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Survivors can die from hypothermia. Hypothermia is a killer! Remember that hypothermia is not easily recognizable.

The symptoms of hypothermia

When hypothermia sets in, the victim:

- Is exhausted
- Is reluctant to do anything
- Finds it difficult to reason
- Has slow mental and physical reactions
- Has a poor sense of touch
- Has slurred speech
- May have swollen lips, hands and feet

In the early stages of hypothermia, the victim will be shivering - this is the body's way of generating that extra heat.

As the victim goes from mild to severe hypothermia, the following occurs:

- The muscles become more and more rigid
- The pulse slows down and becomes weak
- The heartbeat speeds up and slows down
- Unconsciousness occurs when the internal temperature falls below 31° C
- The shivering subsequently ceases and the pupils dilate
- As the victim's body core temperature falls further, the pupils do not react and the muscles relax. As the temperature falls below 30° C, it is difficult to recognize whether a person is dead or alive. **DEATH is very near!**

How to protect yourself against hypothermia:

- Wear plenty of clothing. Layers of clothing or windproof and waterproof clothing are ideal
- Keep clothing dry in cold and wet weather
- Keep the survival craft dry
- Keep the life raft canopy or boat covers closed
- Do not swim around. Exhaustion makes you more prone to hypothermia
- Survivors in water should take the **HELP** or **group huddle posture**
- If there isn't a survival vessel and survivors are in the water, they should try to raise themselves out of the water, using the floating wreckage around them

If you work on vessels in areas where water temperatures are down to freezing point, you might consider purchasing a commercially available **Survival or**

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Immersion suit. They are designed to protect survivors from the effects of hypothermia in some cases from temperatures down to **–30° C.**

How to treat hypothermia in the liferaft:

- Shelter the victim from wet, windy and cold conditions. Close up the raft.
- Get the person dry and warm; rest them on top of some lifejackets.
- Raise the body's core temperature gradually by wrapping them in blankets.
- Body to body contact may be best with someone who is already warm.
- If a **Thermal Protective Aid** is available, put both persons into that.
- Give warm water. Warm it by placing it against warm person's body.
- **DO NOT** give alcohol as this simply worsens the condition
- **DO NOT** rub victim's skin. Severe bruising and skin damage will occur.

Exactly what to do when aboard a rescue vessel:

- Remove the victim's wet clothing and replace it with dry clothes.
- If possible, carry the victim horizontally from the water. Once the victim has been carried on board, place him or her in the "recovery" position.
- Get the victim to rest in the warm environment.
- Wrap the victim in blankets only if the air temperature is less than the water temperature. You may wrap the victim in thermal, or 'space' blankets to raise his or her temperature.
- The victim can huddle with other people under covers. This will transfer body heat to the victim.
- Wrapping the victim alone in a blanket will not be of much use, because his or her body is not generating enough heat.
- You can bathe the person in **warm** water (not hot) to raise the victim's body core temperature.
- You can apply heating pads or **warm** water bottles to the victim's neck, groin, head and chest. Be careful, however, as cold skin can easily burn.
- **Do not** touch or handle the victim when it's not necessary. His or her movements should be kept to minimum.
- **Do not** massage the victim's body or limbs. This may cause skin damage.
- If the victim is conscious and has gag and cough reflexes, give him or her warm sweet drinks. **Do not** feed anything to an unconscious person.
- **Do not** give alcohol to the victim.
- If the victim is not breathing or the heart appears to have stopped, administer artificial respiration and cardiac resuscitation immediately.
- In all cases of hypothermia, seek a doctor's advice - if this is possible.

Dangers due to cooling in water

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The biggest danger to survivors is from **hypothermia**.

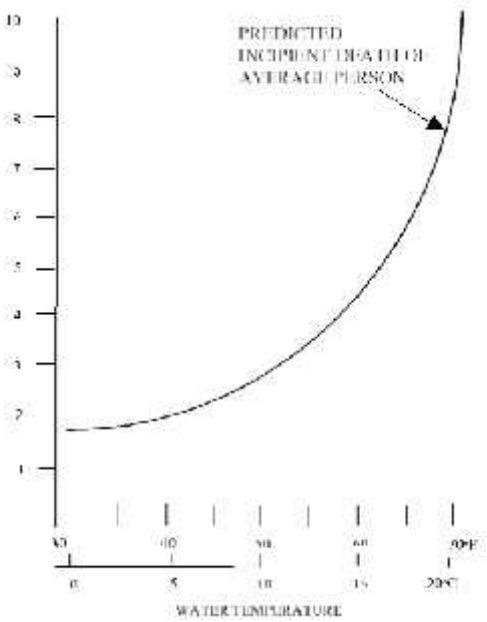
The rate of cooling in water is 26 times faster than in the air. As the body loses heat in large amounts, we shiver intensely. It's the body's attempt to counteract the large heat losses.

The rate of cooling depends on the:

- Water temperature
- Physique of the person
- Wind speed
- Weather conditions
- Person's clothing

How long can a person survive in water?

In the graph below, the usual times of survival in relation to water temperature are given.



In water less than 10°C, the predicted survival time is less than three hours. In temperatures above 20°C, the survival time would depend upon the person's body.

Although the temperature of the skin would fall immediately, it would take 15 to 20 minutes for the temperature of the heart to fall. A fall of body core temperature by 3° to 5° is sufficient to put a survivor in severe hypothermia.

How to minimize loss of body heat

The body regions with a high rate of heat loss are:

- Head and neck
- Sides of the chest
- Groin region
- Do not swim. Survivors should not try to swim as more body heat is lost due to increased circulation of blood. If survivors do not have a life jacket, they should tread water to keep their heads above water.
- Lie still. Someone wearing a life jacket and swimming loses nearly 35 per cent more heat than someone who is lying still.
- Adopt the heat-escape-lessening posture (HELP) or form the group huddle.

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To minimize body contact with water and protect the areas of high heat loss.

HELP (heat-escape-lessening posture)

The HELP posture increases the survival time by 50 per cent. It should be taken if the person is wearing a life jacket. The life jacket would keep the head above water reducing body heat loss. The inner side of the arms are held close to the sides of the chest and the thighs are kept raised to protect the groin area.

The group huddle

If there are several survivors in the water, they should form a ring facing towards
the centre and linking their arms together. This is called a *group huddle. The* water inside the ring will be calmer than outside. This will prevent the direct splash of water on the face and lessen the body heat loss on one side of the body.
Remember that clothing should not be removed. It provides protection against hypothermia! The layers of clothing do increase buoyancy and slow down the rate of body heat loss. It is preferable to wear shoes than to be barefooted or to wear only socks.
A life jacket offers some protection against hypothermia but not very much
Survival times for a lightly clothed adult in water:

Situation	**Action/Behaviour**	**Predicted survival time**
No life jacket	Jacket treading water	2.0 hours
Life jacket	Swimming	2.0 hours
Life jacket	HELP	4.0 hours

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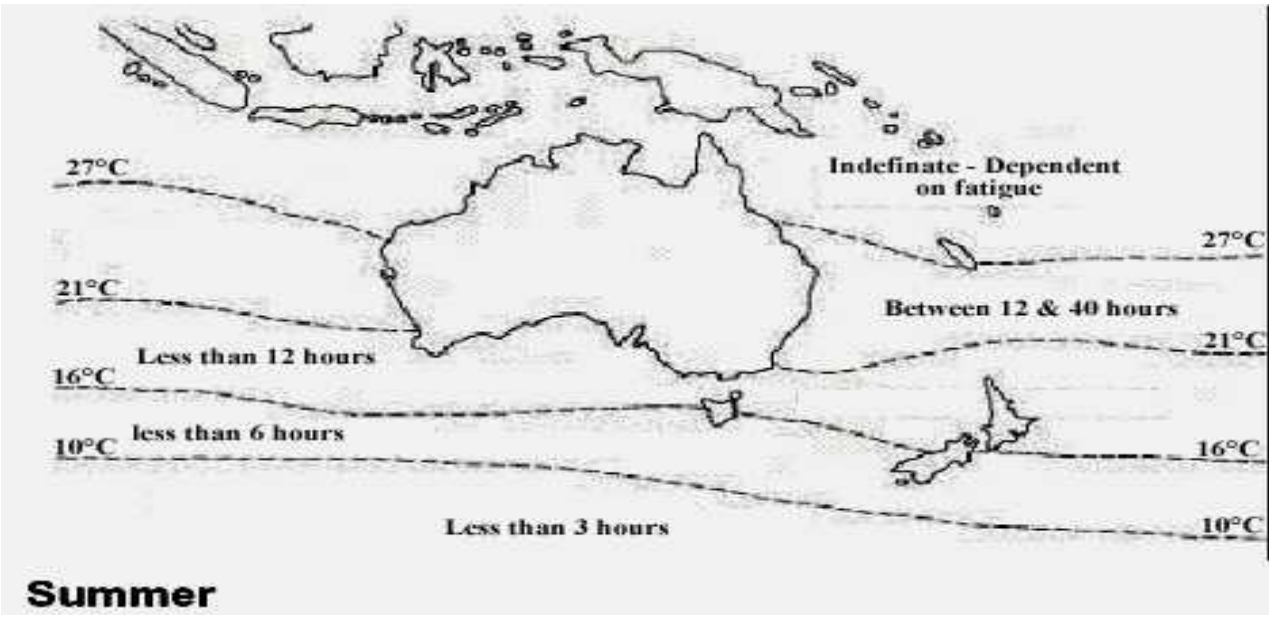

HYPERTHERMIA

There are three main types of hyperthermia or heat stress:

- Heat cramps
- Heat exhaustion
- Heat stroke

A prickly heat rash is an annoying but less disabling form of heat stress.

Heat cramps and heat exhaustion result from dehydration and salt depletion as the body sweats to lower its internal temperature. Heat stroke occurs when the body core temperature exceeds 41°C (105°F) because its cooling mechanisms have broken down. This condition can cause death. Heat stroke requires immediate medical attention. You can avoid almost all cases of hyperthermia by taking preventative measures.

HEAT CRAMPS

These painful spasms usually occur in your arm and leg muscles. They can be disabling, but they are preventable if you pay attention to replacing the salt and water lost through sweating. Heat cramps can be treated by gently stretching the muscle, applying ice, and by rehydration.

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HEAT EXHAUSTION

Heat exhaustion occurs when your body cannot get rid of the heat it generates from metabolism and exercise. If you do not replace the fluids lost through sweating, you may develop heat exhaustion. Although a person suffering from heat exhaustion can continue to produce sweat, the production is not great enough to cool the body satisfactorily. While there is no significant rise in the core body temperature of a victim of heat exhaustion, the condition can rapidly develop into heat stroke. The symptoms for heat exhaustion are the same as for shock.

Symptoms of Heat Exhaustion:

- Cool clammy skin
- Weakness or fatigue
- Headache
- Nausea, vomiting
- Muscle cramps
- Dizziness
- Confusion

Treatment:

Remove the victim to a cool area. Cool the victim if necessary, and replace the water and salt lost by dehydration. Have the victim lie down with feet elevated. Although a victim of heat exhaustion may feel better almost immediately and wish to return to work, 24 hours of rest is needed for adequate rehydration to occur.

HEAT STROKE

Heat stroke is a life-threatening condition demanding immediate medical attention. As the body core temperature approaches 41°C or 105°F, the victim can no longer produce sweat. The skin usually becomes hot and dry (classic heat stroke). Be aware, however, that the skin may remain relatively cool and clammy with exertional heat stroke. If the core body temperature continues to rise, the victim will die. Provide interim treatment and transport victims of heat stroke to a medical treatment facility as soon as possible as complications frequently develop.

Symptoms of Exertional Heat Stroke:

- **Pale, cool damp skin *or* hot, dry, red skin**
- Irrational, hostile behavior
- Rapidly rising core temperature
- Headache, dizziness

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- Nausea and vomiting
- Collapse

Symptoms of Classic Heat Stroke

- **Hot dry skin**
- Rapidly rising core temperature
- Rapid pulse
- Headache
- Nausea and vomiting
- Delirium
- Convulsions
- Collapse and coma

Interim Treatment - prior to evacuation to a medical centre:

- **Get the victim out of the sun into the coolest possible location**.
- Loosen tight clothing and elevate the feet.
- **Cool the victim as quickly as possible**, paying particular attention to the head, armpits, and groin. Drape the victim with lukewarm wet sheets or towels to conduct heat away from the body.
- Fan the body using electric or hand-held fans. Try to place the victim on a screen so they can be cooled both from above and below. **The aim is maximize evaporation from the body to cool the core body temperature - without chilling the victim.**

To cool a victim of heat disorder:

- An efficient way to cool the casualty is to douse them with lukewarm water or cover with wet clothing.
- Use water, wet blankets, or wet clothing to cool the skin of the victim.
- Use water with a temperature that is warm to the touch but cooler than skin temperature. This temperature produces the best cooling effect by evaporation and **conduction**. Water that is too cold will effectively shut down the blood supply to the skin. It can also induce shivering as the body works to warm up that local area.

TRANSPORT THE VICTIM TO A MEDICAL CENTRE AS SOON AS POSSIBLE

Prickly heat/heat rash

This skin condition is common in the tropics. It is aggravated by high humidity. Tiny droplets of sweat become trapped under the outer layer of skin. These

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droplets appear as an irritating, blister-like red rash. Frequent showering helps prevent its development. Sometimes a drying lotion and a mild talcum powder help, but ointments and creams will clog up the outlets of your sweat glands even further.

SUNBURN

The sun produces ultraviolet **radiation** that can cause serious burns to your eyes and skin. Both direct and reflected radiation cause burning, and the best way to avoid sunburn is to avoid **exposure** as much as possible. You can do this by wearing sunglasses with polarizing lenses and by using sunscreen on your exposed skin. Various products are available that contain agents to block out UV radiation. Skin damage from repeated episodes of sunburn can lead to skin cancer, including melanoma. Pay special attention to your hands; maritime workers frequently develop skin cancers on their hands due to prolonged exposure to the sun.

Factors influencing UV radiation exposure:

- **Altitude**: An increase of 300 metres (1,000 feet) in elevation causes an increase in UV radiation of 4%. High altitude results in high UV exposure year round.
- **Latitude**: The closer one is to the equator, the more intense the UV radiation.
- **Time of day**: UV radiation causes most damage between 10 a.m. and 3 p.m. when the sun is highest in the sky.
- **Season of the year**: Except near the equator, the UV radiation is more intense during summer months when the sun is closer to Earth.
- **Wind**: Wind masks the effect of UV radiation.
- **Filters**: Sunglasses fitted with polarizing lenses will cut down UV radiation exposure to your eyes.
- **Ozone depletion of upper atmosphere**: Some areas on Earth are now less protected from UV radiation due to ozone depletion (Arctic, Antarctic, southern South America, Australia).
- **Environment**: Depending upon your surroundings, varying amounts of UV radiation will be reflected. For example:
    - Vegetation reflects only 2.5%
    - Sand reflects 20%
    - Glaciers and snowfields reflect 85%
    - Water can reflect almost 100% if the sun is overhead

Treatment:

- Keep the sunburned area covered loosely to stop exposure to more sun.

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- Cold compresses help; creams or lotions may help, but do not apply them to blisters.

Prevention

- Avoid long periods of exposure, especially between the hours of 10am and 3pm.
- Wear a broad brimmed hat, shirt, long pants, sunglasses, and sunscreen when appropriate. Shorts expose your legs to sunburn.
- Wear a broad spectrum, water-resistant sunscreen with a SPF of at least 15 (on your face use an SPF of at least 30). For full effect, apply sunscreen carefully and thoroughly to skin, especially on your hands, at least 15 minutes before you are exposed.
- Sunscreen agents: A sunscreen's effectiveness is measured by a number called a sun protection factor (SPF). The higher the number, the longer you are protected from burning. That is, if the SPF is 10, then you are protected 10 times longer than if you use no sunscreen. This effectiveness is reduced if you are sweating or swimming. For continuous protection, you must apply sunscreen frequently to exposed skin, especially if swimming or sweating.
- Taking certain medications often increases a person's sensitivity to UV radiation. These include tetracycline, sulphonamides, and oral anti-diabetics.

Drowning

Remember these facts about drowning:

- Drowning kills in minutes!
- Life jackets are provided for short-term survival and survivors should try to board the survival craft as soon as possible.
- Lifebuoys may be used to keep people from drowning.
- Excessive intake of water in air passages can cause asphyxia. First aid treatment should be given to the person as soon as he or she is removed from water.

Shark attacks

To avoid attracting sharks:

- Do not fish in shark infested waters. If sharks are seen in the area while fishing, it is better to abandon the fishing line from the survival craft.
- Do not keep any part of your body hanging outside the survival craft.
- Do not throw food waste overboard.

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- Remain quiet and still.

And remember, do not try to attack or incite the sharks.

Exhaustion

Due to limited food supply and the movement of the life raft, the survivors may feel exhausted and tired. Keep body movements to a minimum and conserve energy.

The survival ration is just enough to maintain minimum body requirements.

Dehydration

Loss of water from the body can kill in days!

The following activities increase fluid loss from the body:

- Sweating
- Exertion
- Eating fish
- Drinking seawater
- Vomiting
- Seasickness-which is very demoralizing

Survivors with nausea should vomit outside the life raft, or into the plastic bags.

Anti-seasickness tablets should be issued to everyone.

Remember, never drink:

- Seawater
- Urine

Drinking seawater does not extend survival time. In fact you will die from sodium poisoning in about the same time as having no water at all. It causes kidney failure and is a much more painful death.

As the juice from fish and birds is salty, it should not be consumed, unless additional water is available. However, the *spinal* fluids of fish contain water and may be safely sucked out and swallowed.

Urine is body waste and is of no use to the body. It is toxic waste and does not

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extend survival time.

Loss of will to live

Survivors are in real danger of losing morale and the will to live. It is important to keep a positive attitude about survival and rescue. This will extend the survival time until you are rescued.

A strong will to live makes a real difference. People with high morale survive more severe conditions than those with low morale.

How to maintain the will to live

Remember that people behave differently when packed together.

- The knowledge of equipment and how to use it helps keep morale high.
- People's will to live is strengthened when they are occupied. Passing time is a big issue in a survival craft. The person in charge should keep the survivors busy with duties and keep them comfortable.
- **Smoking** exacerbates thirst and should not be allowed if the water supply is low.
- If smoking is to be allowed, be very careful with matches and cigarettes. As well, the comfort of other occupants should be kept in mind.
- Morale may be sustained by singing, prayers, and discussions and by telling jokes.
- Remember, however, that these activities may make the throat dry so do these activities only if there is enough water.

How to clear away from ship:

• Distance from the sinking vessel.
• Survivors in the water.
• Use of safety equipment.
• Communication.
• Marshall.

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Clearing the ship's side.

After launching and releasing the falls the next step is get clear of the ship's side in a lifeboat, is can be done by engine or alternative by oars.

Using the engine:
1. Before launching check rudder position to clear the vessel.
2. After releasing the hooks pick up speed to take of the tension of the painter line.
3. If possible release the skids,
4. Release the painter line and steer clear of the painter line.
5. Pick up survivors and marshall liferafts.

6. Proceed to a safer area.
7. Stay together and prepare sea anchor for deployment.

Using oars:

If the engine is not working the boathooks can be used to clear the ship by pushing. If distance is obtained the oars can be used to reduce the tension on the painter line.
• The coxswain is in charge and will give orders to install the oars.

• The orders will be explained by the coxswain.

With use of the engine the painter line can be used to assist in clearing the ship's side by steering away with Attached painter line. When enough distance the painter line can be released with fast release system.

Distance from the sinking vessel.

If the vessel is drifting proceed with lifeboats and rafts to a safe area. The safe area is determined by wind direction and wind force. Normally a distance ranging from a ¼ till 1½ nautical mile is normally sufficient. Main objective is to stay close to

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vessel because of last position and visibility from air.

Clearing the ship with liferaft.
When clearing the vessel on the leeward side it is more difficult to move away from the drifting vessel, the decision of launching a liferaft must be done with taking in mind the wind direction and best position to launch the liferaft.
The lifeboat and rescue boats are in a position to pick up the liferafts and marshall them to a safe area.

Survivors in the water.

During an abandonment the coxswain will keep open communications with other life boats by means of VHF radio. If other survivors are in the water an attempt must be made to pick up the survivors.

Approaching survivors:
1. Prepare pick up by asking the crew members in the lifeboat to assist.
2. Determine to open a hatch on one site.
3. Use equipment such as ladder, rescue line and boathook.
4. During approach keep the survivor(s) at the upwind side, to prevent drifting over the survivors.
5. Stop propeller to prevent injuries.
6. Get the survivors in backwards (panic) or use ladder.
7. Threat survivor injuries/hypothermia.

Handling survival craft and rescue boats in rough

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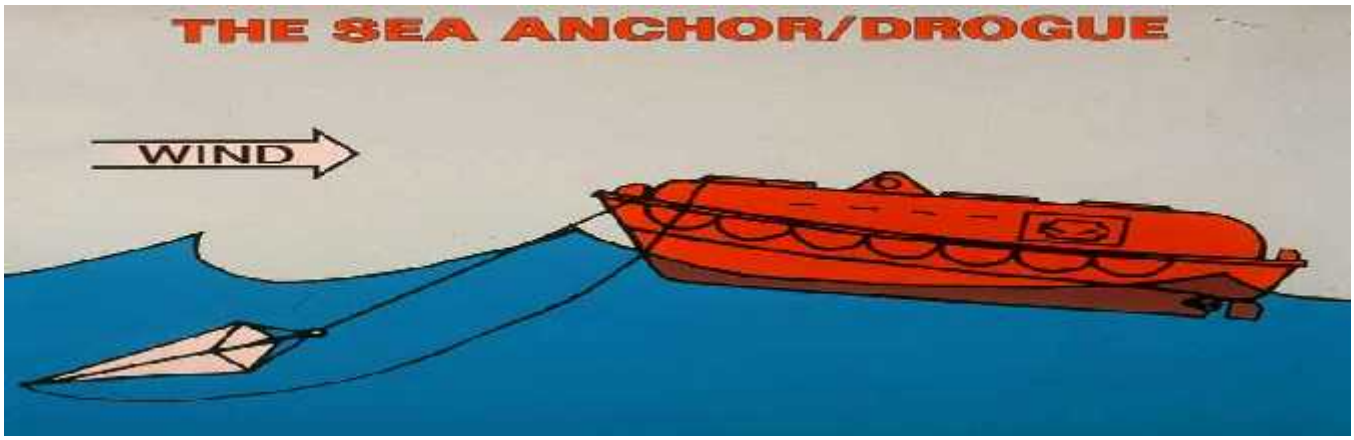
Lifeboats and sea anchor.
Life-saving appliance (LSA) Code; Lifeboatequipment.
A sea-anchor of adequate size fitted with a shock-resistant
hawser which provides a firm hand grip whenwet. The strength of the sea-anchor, hawser andtripping line if fitted shall be adequate for all seaconditions.

A sea anchor must be deployed and connected to the bow of the lifeboat, the lifeboat will stay floating behindthe sea anchor. The advantage is that the engine can be stopped and the lifebaot is slowly drifting. Also it willmaintain the bow against the waves and swell. Otherwise the lifeboat will drift abeam on the waves and swell andsea sickness will start. If the stern of the lifeboats is well shaped also the sea anchor can be deployed at the stern.



The sea anchor in a lifeboat is equipped with a hewing (hawser) line and a tripping line. The tripping line is used if the sea anchor must be retrieved.

Liferafts and sea anchor.
Life-saving appliance (LSA) Code; general requirements for liferafts / equipment.

Two sea-anchors each with a shock resistant hawser and tripping line if fitted, one being spare and the other permanently attached to the liferaft in such a way that

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when the liferaft inflates or is waterborne it will cause the liferaft to lie oriented to the wind in the most stable manner. The strength of each sea-anchor and its hawser and tripping line if fitted shall be adequate in all sea conditions. The sea-anchors shall have means to prevent twisting of the line and shall be of a type which is unlikely to turn inside out between its shroud lines. The sea-anchor permanently attached to davit-launched liferafts and liferafts fitted on passenger ships shall be arranged for manual deployment only. All other liferafts are to have the sea anchor deployed automatically when the liferaft inflates.

Liferaft with deployed sea anchor.

Liferaft without deployed sea anchor.

Important is to use the sea anchor to prevent that the winds willl tip over the liferaft. Important is to retrieve the sea anchor during marshalling by lifeboat or rescue boat. Also the use of the sea anchor is gone if the rescue helicopter will produce a lot of downwash.

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Beaching with lifeboats

If land is in sight and an attempt is made to beach the lifeboat, rescue boat or liferaft the risks are in the surf, how to proceed:

1. Be aware of the location for beaching (e.g. rocks, cliffs, coral, etc.)
2. Before the surf bring bow from lifeboat or rescue boat against the surf.
3. Deploy sea anchor and with engine or oars try to keep the bow steady against the surf.
4. Rescue boat must tilt and stowed the outboard engine.
5. A life raft is beaching with the sea anchor deployed.
6. If you will feel the ground the embarkation canstart.

How to ration and issue water and emergency food.

Man has several liters of water in his body, from which he can draw without serious symptoms. In a cold climate the survivor will not feel real thirst in the first days after shipwreck. All the same, the following procedures should be followed:

• Do not drink on the first day.
• Drink half a liter each day as a minimum.

On the first day after a shipwreck, the body will still have sufficient warer, and the ingested water will only pass through the body. After the first day, the daily consumption of half a Liter will replace the basic loss by sweating and passing of urine. The water loss due to sweating is at a minimum of half a liter even in a cold climate. The minimal excretion of urine is around half a liter a day. By replacing half of this loss, survival time will be around 10-12 days on half a liter of drinking water a day. In the tropics water los s due to sweating will increase, and every effort should be taken to keep the raft as cold as possible.

The roof or canopy should be sprayed with seawater in order to cool it, thus decreasing the temperature inside.

• Never drink seawater.
• Never dilute your fresh water with seawater.
• Seawater has a high content of salts, and some of these will promote urine excretion.
• Do not try to restrict your drinking water intake.

In the history of survival at sea there have been several cases where castaways have been found dead with their freshwater tanks half filled. You and your body need water to survive - take it.

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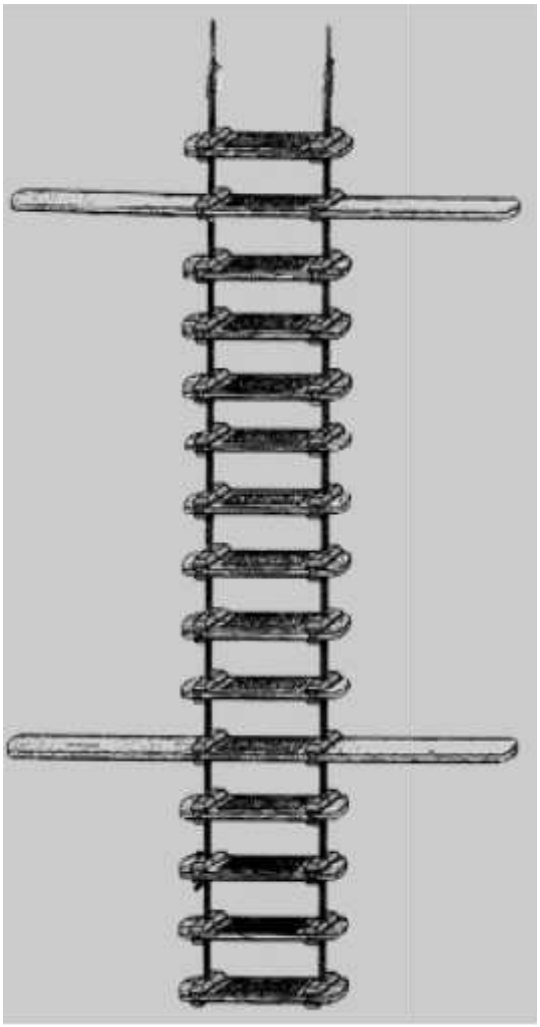
Embarkation ladders

Handholds shall be provided to ensure a safe passage from the deck to the head of the ladder
and vice versa.
The steps of the ladder shall be:



- made of hardwood, free from knots or other irregularities, smoothly machined and free from sharp edges and splinters, or of suitable material of equivalent properties;
- provided with an efficient nonslip surface either by longitudinal grooving or by the application of an approved nonslip coating;
- not less than 480 mm long, 115 mm wide and 25 mm in depth, excluding any nonslip surface or coating;
- equally spaced not less than 300 mm or more than 380 mm apart and secured in such a manner that they will remain horizontal.

The side ropes of the ladder shall consist of two uncovered manila ropes not less than 65 mm in circumference on each side. Each rope shall be continuous with no joints below the top step.
Other materials may be used provided the dimensions, breaking strain, weathering, stretching and gripping properties are at least equivalent to

those of manila rope. All rope ends shall be secured to prevent unraveling.

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Chapter 8
Emergency radio equipment

Two-way VHF radiotelephone apparatus

On board of survival crafts there are several means of communication. Probably the most effective and reliable is radio communication because it is possible to contact rescuers on a long distance. Not all the systems are permanently installed and should be brought to the lifeboats (and rafts) in case of an emergency The different systems presently in use are:
• VHF radio (Very High Frequency)
• EPIRB (Emergency Position Indicating Radio Beacon)
• SART (Search And Rescue Transponder) Very high frequency radios

VHF installations come in two types, fixed and portable. Portable sets are used for communication on board the installation. The range and capacity of the batteries of these handsets are limited. In case of an emergency the handsets are used for communication between muster points and bridge, the handsets can be taken inside lifeboats- and rafts for communication.

The law requires the following channels to be installed:

Channel 6 Inter ship
Channel 15 Intership
Channel 16 Ship to ship
Channel 17 Inter ship
Channel 67 Search and rescue working
Channel 70 Digital Selective Calling DSC

The fixed installations are built into lifeboats and will generally have more channels to choose from, but will atleast have the above mentioned. The range of a maritime VHF installation working on full power (25watt) will have maximum 30 – 60 nautical miles, depending on weather conditions and antenna height. In case of an emergency, channel 16 can be used to transmit a Mayday call; however this not anymore guarded for 24 hours. So use the digital selective calling frequencies instead. By a spoken message is case of an emergency we always use the Standard English Marine vocabulary. An emergency call will be send as:

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MAYDAY MAYDAYMAYDAY!
This is: (name and call sign 3x)
MAYDAY!
This is: (name and call sign 1x)
Our position is: (degrees/minutes or distance/bearing, name of installation or vessel)

Give necessary info:
• Nature of distress.
• What assistance is required.
• Amount of people involved.
• Other useful information.

DSC
With the implementation of the GMDSS convention we also changed from spoken emergency calls in DSC Digital Selective Calling. Sending in digital language is more clear and will be less disturbed by bad radio signals. For DSC special frequencies are appointed for use.

EPIRB

Emergency Position Indication Radio Beacons are required
on ships and offshore installations. The beacons are self powered by means of batteries and transmit signals to satellites.
These satellites are from the Cospass / Sarsat system, an international co-operative search and rescue effort. The system ensures a global coverage, 24 hours a day and contributes to help saving lives of seaman in distress. The E.P.I.R.B., once operated, automatically transmits a signal that is recognized by the satellite as an emergency call. The satellite will determine the position of the beacon and will then pass the information through to an earth station. From here the information is transferred to the Rescue Co-ordination Centre, nearest to the emergency position of the beacon. From this centre the SAR operation starts or the information is relayed to another SAR centre. Additionally the EPIRB's will send a signal out that can be picked up by SAR helicopters and also vessels equipped with the necessary homing devices. The homing devices will send the searching party straight to the person or persons in distress.

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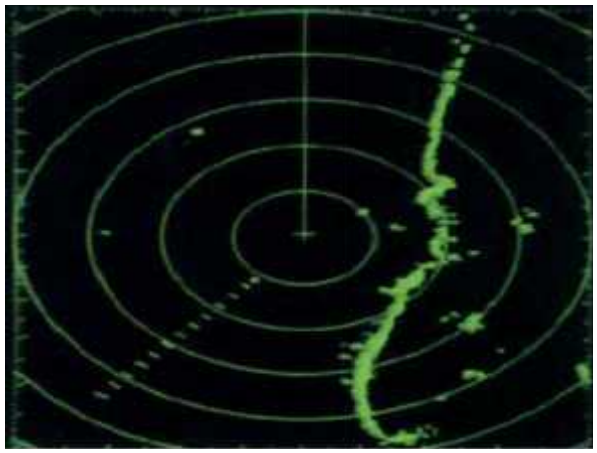
SART

Sart's



Radar screen

The Search and Rescue Transmitter SART is a transmitter which can be used to take with you in the lifeboat or liferaft. It can also be possible that the life boat is equipped with a SART. This is by the way not a requirement. The Search and Rescue Transmitter SART is a passive beacon until interrogated by radar frequency. It will then automatically transmit series of pulses, which are displayed on the radar screen of passing aircraft or vessels. The pulses are very obvious and therefore easy to recognize by the radar operator. Once recognized the navigator can plot the emergency position, the system is only for short range.

Distress signals, signaling equipment and pyrotechnics

Parachute flare.

Pyrotechnics are part of the signaling equipment found in the inventory of lifeboats, life rafts, ships, aeroplanes and helicopters. They may play a vital part in locating persons in distress. Warning : All pyrotechnics should be handled with care. They can be dangerous when safety is disregarded. Since there are many different types of pyrotechnics and various manufactures, always make sure to read the operating instructions first. In order to ensure a safe way of activating the signal, even by people who do not know how to read the instructions are also depicted in so-called pictograms.

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Rocket/parachute flare: a flare is a good pyrotechnics to attract attention over great distance. Useable during day or night, not with fog and low clouds. The visibility in clear weather is ranging from 30 to 40 sea miles. When a parachute flare is activated, a rocket is fired to a height of approximately 300 meters. When the flare is ignited a bright light burns for about 1 minute, the parachute keeps the flare in the air as long as possible. During the ascent of the rocket, the wind influences the tail in such a manner that the rocket turns into the wind. The flare will drift over your position when hanging on the parachute, giving an indication of your location. Never use flares when helicopters are nearby! They may damage the aircraft and interfere with your own rescue!

Hand Flares

Hand flares are used to pinpoint your position. Effective both day and night, not with foggy weather. The visibility is around 6 sea miles in clear weather. Never look into the flare. The light may damage your eyes. These flares provide
their own oxygen when burning which means that splashing waves will not extinguish the flare. They will continue burning even when held under water. These hand-held flares burn for about 1 minute.

Hands flare

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Smoke Signal

Smoke signals.

The use of the smoke signal is to pinpoint your position and to indicate the wind direction. Effective only in daytime, not with foggy weather. The visibility depends on the wind force. After the smoke signal is activated it must be thrown in the water.

Visual and audible distress signals

Signal mirror or heliograph; it is possible to attract attention over long distances, up to 20 miles by reflecting the sun rays to a ship, airplane or coastline. The limitations are that the sun must be shining and it doesn't work 360 degrees around. Signaling torch.(Flash light); very valuable source of light inside your life raft/life boat. It can also be used to attract attention
at close range for instance to contact other life rafts or lifeboats. Morse code can also be sent. The torch is waterproof and spare batteries are provided as well. Whistle; in the inventory we also find a whistle, just like the ones we have on our life jackets or survival suits. Not very effective,
since the sound of waves and wind will in most cases overrule the whistle. Radar reflector; this will provide in a better reflection on the radar screen of a searching vessel, airplane or helicopter. It is important that the radar reflector is installed in a correct way. (Not to be used together with SART)

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LINE-THROWING APPLIANCES

Every line-throwing appliance shall:

- be capable of throwing a line with reasonable accuracy;
- include not less than four projectiles each capable of carrying the line at least 230 m in calm weather;
- include not less than four lines each having a breaking strength of not less than 2 kN;
- have brief instructions or diagrams clearly illustrating the use of the line-throwing appliance.

The rocket, in the case of a pistol-fired rocket, or the assembly, in the case of an integral rocket and line, shall be contained in a water resistant casing. In addition, in the case of a pistol-fired rocket, the line and rockets together with the means of ignition shall be stowed in a container which provides protection from the weather.

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GENERAL EMERGENCY ALARM SYSTEM

The general emergency alarm system shall be capable of sounding the general emergency alarm signal consisting of seven or more short blasts followed by one long blast on the ship's whistle or siren and additionally on an electrically operated bell or klaxon or other equivalent warning system, which shall be powered from the ship's main supply and the emergency source of electrical power required by regulation II-1/42 or II-1/43, as appropriate.
The system shall be capable of operation from the navigation bridge and, except for the ship's whistle, also from other strategic points.
The system shall be audible throughout all the accommodation and normal crew working spaces.

- The alarm shall continue to function after it has been triggered until it is manually turned off or is temporarily interrupted by a message on the public address system.
- The minimum sound pressure levels for the emergency alarm tone in interior and exterior spaces shall be 80 dB (A) and at least 10 dB (A) above ambient noise levels existing during normal equipment operation with the ship underway in moderate weather. In cabins without a loudspeaker installation, an electronic alarm transducer shall be installed, e.g. a buzzer or similar.
- The sound pressure levels at the sleeping position in cabins and in cabin bathrooms shall be at least 75 dB (A) and at least 10dB (A) above ambient noise levels as regulated in A.830(19).

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PUBLIC ADDRESS SYSTEM

The public address system shall be a loudspeaker installation enabling the broadcast of messages into all spaces where crew members or passengers, or both, are normally present, and to muster stations. It shall allow for the broadcast of messages from the navigation bridge and such other places on board the ship as the Administration deems necessary. It shall be installed with regard to acoustically marginal conditions and not require any action from the addressee. It shall be protected against unauthorized use.

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Chapter 9
Helicopter Assistance

SAR organisation
Search and rescue (SAR) comprises the search for, and provision of aid to, persons who are feared to be, in need
of assistance. The two operations search and rescue may take many forms, depending on whether they are both required, on the size or complexity of the operation and on the available staff and facilities. It is necessary that the available resources are so organized and co-ordinated that effective and extensive search and rescue operations can be assured. This requires the establishment of a search and rescue organisation provided with a SAR plan and the means for carrying it into effect.

- ILO , International Labour Organisation
- WHO, World Health Organisation
- WMO, World Meteorological Organisation
- IMO, International Maritime Organisation

In the field of SAR, IMO is the most important organization in UN. As mentioned before 1960 was are markable year in SAR. In 1960 all IMO members signed the SOLAS convention. SOLAS stands for Safety of Life At Sea. In the SOLAS convention all members agreed on the
following:
- Each member is responsible for a so-called Search and Rescue Region (SRR).
- International emergency frequencies are laid down.
- All participants are obligated to render assistance in case of an accident.

Nowadays SAR can be translated as:
- SAR units are on voluntary base.
- Specially trained SAR units.

In order to get SAR operations started it was agreed that in case of an accident the country in whose SRR the accident took place is responsible for the co-ordination of SAR actions, irrespective of the nationality of the person or object in distress. If the position of the accident is not exactly known the most probable SRR country is

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appointed as the co-ordinating country and remains responsible until the exact position of the calamity is known. The cooperation between the IMO International Maritime Organization and ICAO International Civil Aviation Organization is described in the IAMSAR International Aeronautical and Maritime Search and Rescue manual. In the Volume I, II and III. SAR actions can be divided into two main sections:

- On the shore.
- On the spot.

Actions ashore are co-ordinated by a so-called Rescue Co-ordination Centre. Actions on the spot are co-ordinated by either an OSC On scene commander or a CSS (stands for Co-ordinator Surface Search). If a situation occurs where a Search and Rescue mission is to be initiated the normal course of events would be to alert the Coastguard who would take overall control of the incident. If the nature of the emergency requires the assistance of the Coastguard, they will assume total control until the rescue is complete or the search abandoned. Due to their geographical location, the Coastguard will delegate specific tasks to a person close enough to the scene of the emergency to be able to monitor the situation in detail and who can co-ordinate developments as required. In any large-scale emergency the OSC may also designate tasks.
If the number of surface vessels is sufficient, a C.S.S. may be appointed to control the surface search and report to the OSC. For the air search a helicopter co-ordinator can be appointed to liaison with receptor platforms, organize routing of helicopters and refueling arrangements. In some instances he may also assist with air traffic control.

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Communicating with the helicopter or fixed wing aircrafts.

Helicopters and planes can use VHF communication or signals to reply to lifeboats.

Signals used by aircraft engaged in search and rescue operations to direct ships towards an aircraft, ship or person in distress

PROCEDURES PERFORMED IN SEQUENCE BY AN AIRCRAFT			MEANING
 1 CIRCLE the vessel at least once.	 2 CROSS the vessel's projected course close AHEAD at a low altitude while ROCKING the wings. (See Note)	 3 HEAD in the direction in which the vessel is to be directed.	The aircraft is directing a vessel towards an aircraft or vessel in distress. (Repetition of such signals shall have the same meaning)
CROSS the vessel's wake close ASTERN at low altitude while ROCKING the wings. (See Note) 			The assistance of the vessel is no longer required. (Repetition of such signals shall have the same meaning)

NOTE Opening and closing the throttle or changing the propeller pitch may also be practiced as an alternative means of attracting attention to that of rocking the wings. However, this form of sound signal may be less effective than the visual signal of rocking the wings owing to high noise level on board the vessel.

Air-to-surface visual signals

Signals used by a vessel in response to an aircraft engaged in search and rescue operations

			MEANING
 Hoist "Code and Answering" pendant Close up; or	 Change the heading to the required direction; or	 Flash Morse Code signal "T" by signal lamp.	Acknowledges receipt of aircraft's signal
 Hoist international flag "N" (NOVEMBER); or		 Flash Morse Code signal "N" by signal lamp.	ndicates inability to comply

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Rendering assistance.

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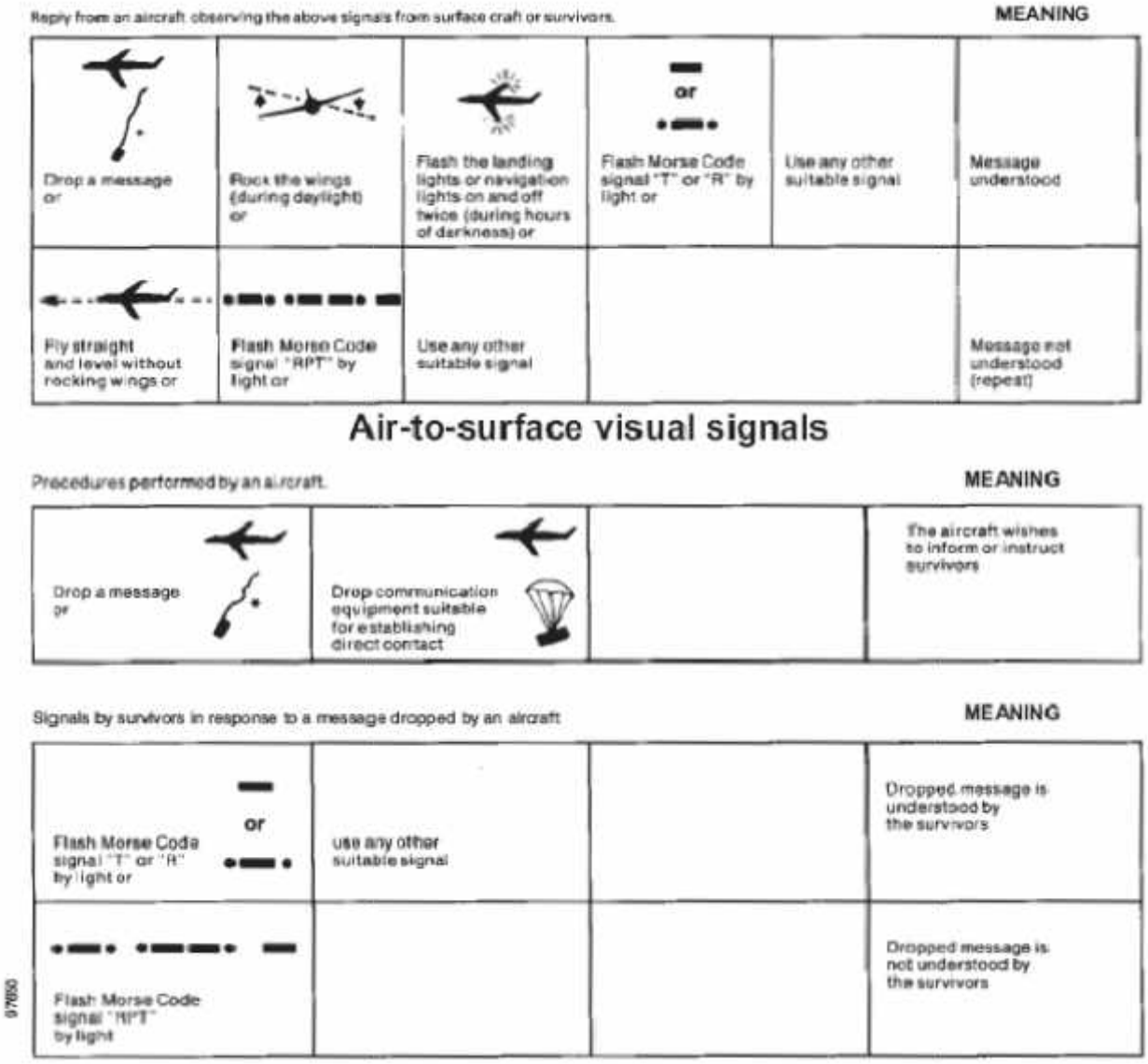

Rendering assistance.

Evacuation from ship and survival craft.

If the survivors are transferred to a helicopter, the following points must be taken into account:

- Communication via channel 16/67.
- The helicopter will fly into the wind at a set speed (10-15 miles/hour).
- You will experience considerable downwash, which causes high winds, recognizable by a circle on the water surface.

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- The Rescue boat must maintain speed and heading.
- The Coxswain should take up a fixed position in respect of the helicopter.
- The high line will be used to make contact with the lifeboat or rescue boat.
- The hoist then follows, preferably using a single or double sling.

High line.

Rescue basket.

Rescue single sling.

Rescue sling.

Helicopter rescue is the most practical and rapid way to recover survivors offs our coast. They are however slowed down by range and fuel load. Also, they may not be able to spend a long time on the scene. To help make the rescue as safe as possible for the flight crew:

- Do not have any lights shining towards the helicopter.
- Steer a course, as directed by the helicopter crew.

This will allow the helicopter to hover into the wind giving the pilot a good view of the vessel.

Always keep in radio contact with the helicopter and follow instructions. When being winched into the helicopter, keep your hands by your sides. When at the door of the helicopter do not reach out or upwards - the winch operator will swing you around to face away from the door and pull you in. You will then end up sitting on the helicopter floor.

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SECURITY TRAINING FOR SEAFARERS WITH DESIGNATED SECURITY DUTES

COURSE *HANDOUT*

(IMO Model Course 3.26/STCW A-VI/1)

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(Ministry of Shipping, Government of India)
www.dgshipping.gov.in

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SECURITY TRAINING FOR SEAFARERS WITH DESIGNATED SECURITY DUTIES
COURSE OUTLINE/SYLLABUS

Sr No	Subject	Hours		
		Theory	Practical	Film
1	**Introduction** 1.1 Course Overview 1.2 Competencies to be achieved 1.3 Currently security threats and patterns 1.4 Ship and port operations	1.0		
2	**Maritime Security Policy** **2**.1 Familiarity with relevant international conventions, codes, and recommendations 2.2 Familiarity with relevant government legislation and regulations 2.3 Definitions 2.4 Handling sensitive security-related information and communications	0.75		
3	**Security Responsibilities** 3.1 Contracting Governments 3.2 Recognized Security Organizations 3.3 The Company 3.4 The Ship 3.5 The Port Facility 3.6 Ship Security Officer 3.7 Company security officer 3.8 Port facility security officer 3.9 Seafarers with designated security duties 3.10 Port Facility personnel with designated security duties 3.11 Other personnel	1.25		
4	**Ship Security Assessment** 4.1 Assessment tools 4.2 On-scene security surveys Assessment tools	1.0		

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5	**Security equipment** 5.1 Security equipment and systems 5.2 Operational limitations of security equipment and systems 5.3 Testing, calibration and maintenance of security equipment and systems	1.0		0.25
6	**Threat identification, recognition, and response** 6.1 Recognition and detection of weapons, dangerous substances and devices 6.2 Methods of physical searches and non-intrusive inspections 6.3 Execution and coordination of searches 6.4 Recognition, on a non-discriminatory basis, of persons posing Potential security risks 6.5 Techniques used to circumvent security measures	1.0		0.5
7	**Ship security actions** 7.1 Actions required by different security levels 7.2 Maintaining security of ship/port interface 7.3 Familiarity with declarations of security 7.4 Reporting security incidents 7.5 Execution of security procedures	0.5		0.25
8	**Emergency preparedness, drills & exercises** 8.1 Execution of contingency plans 8.2 Security drills & exercises 8.3 Use citadel where provided onboard	1.0		
9	**Security Administration** Document & Records	0.5		

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10	**Anti – Piracy** Risk Awareness:- Prior to entering area of risk 10.1 Appraise the strength and vulnerabilities of crew and ships 10.2 Know the anti-piracy measure 10.3 Understanding the content of the best management practices 10.4 Pirates business module	1.5		
11	**Pirate attack** 11.1 Examine the implication of piracy attack 11.2 Assess how to defend the crew and the ship 11.3 Coping in hostage situation	2.0		
12	**The release process** 12.1 Discuss the additional danger associated with the release process	0.5		
13	**Sea Farers Family** 13.1 Enables seafarers to consider what they may wish to share with their family concerning the risk of piracy 13.2 Discussion with participants and assessment	0.5 0.5		
	Total	**13.0**		**1.0**
	Grand Total		**14.0**	

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1. Aim

This model course is intended to provide the knowledge required for seafarers with designated security duties in connection with a Ship Security Plan (SSP) to perform their duties in accordance with the requirements of Chapter XI-2 of SOLAS 74 as amended, the ISPS Code, and section A-VI/6 of the STCW Code, as amended.

2. Objectives

Those who successfully complete the course should be able to demonstrate sufficient knowledge to undertake the duties assigned under the SSP. This knowledge shall include, but is not limited to:

1. Knowledge of current security threats and patterns;
2. Recognition and detection of weapons, dangerous substances and devices;
3. Recognition, on a non-discriminatory basis of characteristics and behavioral patterns of persons who are likely to threaten security;
4. Techniques used to circumvent security measures;
5. Crowd management and control techniques;
6. Security related communications;
7. Knowledge of emergency procedures and contingency plans;
8. Operation of security equipment and systems;
9. Testing, calibration and at-sea maintenance of security equipment and systems;
10. Inspection, control, and monitoring techniques; and
11. Methods of physical searches of persons, personal effects, baggage, cargo, and ship stores.

3. Entry Standards

It is assumed that those attending this course will be serving seafarers or other shipboard personnel and are likely to have designated security duties in connection with the Ship Security Plan.

4. Required Attendance

100% attendance is required for successful completion of the course.

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1 .Introduction

1.1 This course deals with
Maritime Security Policy
Security Responsibilities
Vessel Security Assessment
Security Equipment
Threat Identification, Recognition and Response
Vessel Security Actions
Emergency Preparedness, Drills and Exercises and
Security Administration.

1.2 At the end of this course the seafarer will have an understanding of and be able to deal with the topics indicated above.

1.3 Presently the maritime transportation industry faces threats from piracy and armed attacks, terrorism, contraband smuggling, stowaways and refugees, cargo theft and collateral damage.

Piracy and Armed Attacks consist of any illegal acts of violence or detention committed for private ends by the crew or the passengers of a private ship on the high seas, against another ship or aircraft, or against persons or property on board such ships. Today, the deteriorating security situation in the seas off war- torn Somalia and the Gulf of Aden are at the heart of the problem,.

Another threat to the maritime transportation industry is from terrorism which refers to those violent acts that are intended to create fear(terror), and are perpetrated for religious, political or, ideological reasons and which Deliberately target or disregard the safety of civilians and seafarers. Terrorism is practiced by a broad array of political organizations for furthering their own objectives. The use of similar tactics by criminal organizations for protection rackets or to enforce a code of silence is usually not labeled terrorism though these same actions may be labeled terrorism when done by a politically motivated group.

Contraband Smuggling –which is the clandestine transportation of illegal goods or persons, across international borders, in violation of applicable laws and regulations is another scourge that plagues the maritime transportation industry. There are various motivations to smuggle. These include participation in any illegal trade, such as the drug trade, in illegal immigration ,or illegal emigration, tax evasion etc.

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Stowaways and Refugees – A stowaway is someone who hides on a train, bus, plane, or ship in the hope of travelling for free. There are a number of reasons to stowaway on board a craft, ranging from illegal immigration to a dare. As a general rule, stowaways can be extremely dangerous, both to themselves and to the craft they stowaway on mainly if they are armed; besides, they can also carry serious legal and financial repercussions if they are caught- especially for the craft on which they arrive.

Refugees are persons who are outside their country of origin or habitual residence because they have suffered persecution on account of race, religion, nationality, political opinion, or because they are a member of a persecuted 'social group'. Such person may be referred to as asylum seekers.

Cargo theft- Frauds that occur most commonly in marine world are thefts on ships and other ocean going vessels. Stealing of cargo, especially during times of high fuel cost is common. Such thefts can be appropriated by the owner or the client either way, as frauds and thefts continue to get more technical and treacherous the good thing is that the vigilance for these has also been increasing immensely.

Cargo theft- can be mediated by the owners, crew and sometimes by persons outsides the ambit of both. There have even been cases where the entire ship with its crew and cargo has been diverted to a third country for monetary gain and thereafter disappeared completely.

Collateral damage- is damage to people or property that is unintended or incidental to the intended outcome. The phrase is prevalently used as a euphemism for civilian casualties of a military action which can take place if, for example, military action is taken to rescue person or craft held hostage by pirates or terrorists. Collateral damage is damage aside from that which was intended. Since the dawn of precision guided munitions, military "targeters" and operations personnel are often considered to have gone to great lengths to minimize collateral damage.

1.4 Vessels, port operations and conditions in connection with the intermodal nature of transport and the interfaces between vessels and other modes.
Seaports and maritime transportation infrastructure face myriad threats from the vessels, people, and cargo that move through them.
Shipping is perhaps the most international of all the world's industries. Every year more than 20Q million sea cargo containers move among the world's major seaports.

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Unfortunately, shipping is also extremely vulnerable to crime and terrorism. A terrorist attack on a port or other strategic maritime asset could prove potentially catastrophic to the entire economy of a nation, For companies and authorities involved in international maritime commerce, urgent improvements in port and ship security are now vital.

The September 11th attacks in USA were horrific in terms of the loss of human life and financial damage inflicted, yet they were not the worst-case scenario that many security experts, believe could befall us in future, either in terms of the numbers of casualties or specifically in the use of new weapons of Mass Destruction.

With the formation of extensive global terrorist infrastructures and the increased reach of fundamentalist terrorist groups, the spectra of Suicide Terrorism now threatens Europe and North America and India.

Modern suicide bombing was introduced by the Shlite terrorist organization Hizballah in 1983 in Lebanon, and it was in Lebanon that this modus operandi was refined throughout the 1980's. There have now been well over 300 suicide attacks carried out in 14 countries by 17 terrorist organizations. All this makes it mandatory for a Maritime Security Policy to be put in place, for seafarers with designated security duties to be aware of the hazards involved and the need for heightened security.

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2 Maritime Security Policy

2.1 International conventions, codes and recommendations Piracy attacks constitute one of the principal security risks to commercial shipping in certain regions of the world. Despite international awareness and concerted efforts to combat piracy and armed robbery at sea, piracy attacks against commercial vessels resulting in the disruption of trade have increased exponentially.
Modern pirates are not romantic figures. These ruthless mercenaries utilize small, maneuverable, swift vessels with the ability to overtake commercial ships travelling established trade routes on the high seas. The modern pirates are armed with machine guns and rocks propelled grenades. They imperil commercial traffic and hamper maritime commerce along various trade routes in –the world, seeking the payment of ransom and holding crews hostage. Modern piracy has become a large business enterprises that threatens the stability of maritime trade.
The IMO, which is an agency of the United Nations with 168 member states, is located in the United Kingdom. On November 17, 1983, the IMO adopted Resolution A. 545(13)- " Measures to Prevent Acts of Piracy and Armed Robbery Against Ships". Further amended by " The Safety of Ships And The Security of Their Passengers And Crews"

Piracy is a crime of " universal jurisdiction". Accordingly, any country which apprehends a pirate has not only the right, but a duty to prosecute the perpetrator. This grant of universal jurisdiction to sovereign nations to prosecute individuals committing acts of piracy is incorporated into several international conventions such as The United Nations Convention of the Law of the Sea (UNCLOS) and The High Seas A Convention among others.

2.2.2 The Post -9/11 Response of the Maritime Community to 4 Piracy One of the first responses was The Model National Law on Acts of Piracy and Maritime Violence.

The threat of marine piracy and its detrimental impact upon maritime trade become the collective focus of the Comite Maritime International ("CMI"), the Baltic and International Maritime Counsel ("BIMCO"), the International Chamber of Shipping ("ICS"), Interpol, the International Group of P &I Clubs ("IGP&I"), the ICCC International Maritime Bureau("IMB"), the International Maritime Organization ("IMO") and the United Nations (Office of Legal Affairs/Division for Ocean Affairs and the Law of the Sea.)

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The IMO January 22,2002 Resolution

On November 20, 2001, two months after 9/11 , an assembly of T the 22nd Session of the IMO adopted 22/Resolution 924 entitled Review of Measures and Procedures to Prevent Acts of Terrorism which Threaten the Security of Passengers and Crew and the Safety of Ships. The assembly urgently emphasized the importance and priority of security measures A to protect ships, passengers and crew on the high seas from A terrorism and pirate attacks, and to suppress terrorist acts directed at ports and court personnel. On January 22, 2002, the resolution was passed and published.

Convention for the Suppression of illegal Acts Against the Safety at Maritime Navigation.

United Nations Convention Against Transnational Organized Crime : The Palermo Convention the United Nations Convention Against Transnational Organized Crime (Palermo Convention) was promulgated “to promote cooperation to prevent and combat organized crime more effectively.” To date, there are 147 signatories. The United States signed the convention on Dec 13, 2000, and ratified it on 3 Nov 2005. 39. The Palermo Convention focuses on the profiteering of piracy attacks. Over the past few years, well organized criminal cartels have begun sponsoring and funding the burgeoning business of piracy attacks.

Piracy has evolved into the equivalent of racketeering or a Mafia-like industry. It is reputed that pirates creating have in the Gulf of Aden are now receiving intelligence on 1 shipping routes, cargo, crews, and vessel schematics from accomplices in London via satellite telephone. This advance planning now aided by sophisticated communications technology transforms piracy attacks into the equivalent of military operations. Moreover, technology gives the pirates an enormous advantage and adds an additional transnational element to their attacks.

2.1.3 SOLAS Chapter XI and the contents of the ISPS Code SOLAS Chapter XI deals with special measures to enhance maritime safety. New regulations have come into force; The existing SOLAS Chapter XI (Special measures to enhance maritime safety) has been re- numbered as Chapter XI-1.

Regulation XI-1/3 is modified to require Ships’ identification numbers to be permanently marked in a visible place either on the ship’s hull or superstructure. Passenger ships should carry the marking on a horizontal surface visible from the air. Ships should also be marked with their ID numbers internally.

And a new regulation XI-1/5 requires ships to be issued with a Continuous Synopsis Record (CSR) which is intended to provide an on-board record of the

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history of the ship. A brand new Chapter XI-2 . Special measures to enhance maritime security is after the renumbered Chapter XI-1 .This chapter applies to passenger ships and cargo ships of 569 gross tonnage and upwards, including high speed craft, mobile offshore drilling units and port facilities serving such ships engaged on international voyages.

Regulation XI-2/2 of the new chapter enshrines the International Ship and Port Facilities Security Code (ISPS Code). Part A of this Code is mandatory and part B contains guidance as to how best to comply with the mandatory requirements.

Regulation XI-2/8 confirms the role of the Master in exercising his professional judgment over decisions necessary to maintain the security of the ship. It says he shall not be constrained by the Company, the charterer or any other person in this respect.

Regulation XI-2/6 requires all ships to be provided with a ship security alert system, according to a strict timetable that will see most vessels fitted by 2004 and the remainder by 2006. When activated the ship security alert system shall initiate and transmit a ship to shore security alert to a competent authority designated by the Administration, identifying the ship, its location and indicating that the security of the ship is under threat or it has been compromised. The system will not raise any alarm on-board the ship. The ship security alert system shall be capable of being activated from the navigation bridge and in at least one other location.

Regulation XI-2/10 covers requirements for port facilities, providing among other things for Contracting Governments to ensure that port facility security assessments are carried out and that port facility security plans are developed, implemented and reviewed in accordance with the ISPS Code. The ISPS Code is implemented through chapter XI-2 Special measures to enhance maritime security in the International Convention for the minimum requirements for security of ships and ports. Part A provides mandatory requirements. Pat B provides guidance of implementation.

The ISPS Code applies to ships on International Voyages (including passenger ships, cargo ships of 500 GT and upwards, and mobile offshore drilling units) and the port facilities serving such ships.

The main objectives of the ISPS Code are:

- To detect security threats and implement security measures
- To establish roles and responsibilities concerning maritime security for

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governments, local administrations, ship and port industries at the national and international level.
- To collate and promulgate security-related information.
- To provide a methodology for security assessments so as to have in place plans and procedures to react to changing security levels

2.2 Familiarity with the Indian Government legislation and regulations Bill No 108 of 2004 introduced in the Indian Parliament amends the relevant section of the Merchant Shipping Act 1958 such that the insertion of the word security mean maritime security and includes any measure to protect ports or ships or any person or thing relating directly or indirectly to maritime organization.

2.2.1 the Central Government or such other authority as may be designated by it shall promulgate such rules which conform to the relevant scheme formulated by the international Maritime Organization.

2.3.1 Accordingly as per the Indian Merchant Shipping Act, and in order to comply with SOLAS Chapter YI and the ISPS Code it is mandatory for every vessel to develop implement and maintain a Vessel Security Plan.

A Vessel Security Plan is one which addresses, the requirements laid down in paragraph 9.4 of the Code.

Company Security Officer – A Company Security officer (GSO) has the responsibility of ensuring that a Ship Security Plan (SSP) is prepared and submitted for approval.

Vessel Security officer or Ship Security Officer-

Duties and Responsibilities- without effective ship Security, a vessel is vulnerable to attack. This threat can be minimized by having a knowledgeable Ship Security requires planning, coordination and new responsibilities. The Ship Security officer is an essential element to ISPS code Compliance.

Port facility means a location within a port at which commercial maritime activities occur ships covered by these measures.

Facility Security Officer (FSO) is a person designated as responsible for the development, implementation, revision and maintenance of the facility security plan and for liaison with the Company and Vessel Security Officers.

Recognized Security Organization- Under the provisions of ISPS Code, Indian

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Register of Shipping (IRS) has been nominated as the Recognized Security Organization (RSO) for the purpose of Port Facility Security Assessment and preparation of port Facility Security Plan as permitted under section 15,16 Part A of the ISPS Code.

Security Incident is an act threatening the security of a vessel or terminal. Security Level A security level under the ISPS code describes the current scenario related to the security threat to the country and its coastal region including the ships visiting that country.

As soon as the security level has been decided as per the ISPS code, it is displayed prominently on board vessel at the entrance of the ship.
The Three different Security Levels
LEVEL 1- Normal Level
- In normal level, both ships and port operations are carried out in general way.
- Minimum security measures are always maintained on board and in port.
- Ship and port operation are carried out as per ship and port facility security plan.
- Port facility ensures to keep the ' no access' areas under surveillance at all times.

- Ship and port authority mutually supervise loading and unloading operation of cargo and stores, ensuring access control and other minimum security criteria.
- Minimum access in the ship is maintained at all times

LEVEL 2- Heightened Risk.
- In Level 2, the threat to the security is higher than the normal level.
- All the routine and cargo operations are carried out with an increase in security measures in both ships and ports.
- Look- outs in no access zone and waterside area is to be increased by port and ship authorities.
- Access control is maintained all the time with escorting the visitors and use of security equipment like metal detector etc.
- Communication between port authority and ship administration is always maintained in case of increase in security level.
- Preparing a full or partial search operation of ship.
- A declaration of security is undertaken between port state and ship administration.

LEVEL 3- Imminent danger
Level 3 is imposed when the probability of security threat to ship or port authorities are highest or imminent and specific protective measures are to be maintained.

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- In Level 3, all ship and port operations are stopped and frequent security rounds and duties are carried out by both ship staff and port authorities. Boat petrol are done by port state on the water side.
- Main propulsion plant is always kept ready for moving the ship out of port if require.
- No personal is allowed to access the ship without the authorization of port state official.
- Only one access point is maintained on board at all time.

- Preparing a full search operation of ship or under water hull search operation with port facility.
- Preparation for evacuation of ship by its staff.

A declaration of security is undertaken between port state and ships administration

2.4. Handling sensitive security related information and communications

1 defines security- sensitive information and the importance of keeping it confidential Sensitive Security information or SSI is sensitive but unclassified information obtained or developed in the conduct of security activities, the public disclosure of which would constitute an unwarranted invasion of privacy, reveal trade secrets or privileged or confidential information, or be detrimental to the security of transportation. It is not a form of classification. SSI is not classified national security information in the sense of Top Secret, Secret or Confidential. Information designated as SSI cannot be shared with the general public, and it is exempt from disclosure under the Freedom of Information Act (FOIA)

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3. Security Responsibilities

Security Responsibilities The International Ship and Port Facility Security (ISPS) Code is an amendment to the Safety of Life at Sea (SOLAS) Convention (1974/ 1988) on minimum security arrangements for ships, ports and government agencies.

3.1 Contracting Governments
Under SOLAS chapter X 1-2 and part A of the Code, Contracting Governments can establish designated authorities within the government to undertake their security responsibilities under the Code. Governments or designated authorities may also delegate the Undertaking of certain responsibilities to Recognized Security Organizations (RSOs) outside government.

3.3 The Company- obligations and responsibilities
1 The Company, owners and operators have the primary responsibility for ensuring the safety and security of their ships. Although companies are to comply with the relevant requirements of the ISPS Code, they need not be certified as such.
The Company must appoint a Company Security Officer (CSO) for the company and a Ship Security Officer (SSO) for each of its ships.

The Company shall ensure that the Ship Security Plan contains a clear statement emphasizing the master's authority.

3.4 The Vessel or ship means a passenger ship including high- speed passenger craft regardless of size; cargo ship including high- speed cargo craft of at least 500 gross tons; and mobile offshore drilling units engaged in international voyages.
Every vessel must have a Ship Security Plan which indicates the minimum operational and physical security measures the ship shall take at all times.

3.6 Ship or Vessel Security Officer (SSO)

SSO means the person on board the ship, accountable to the master, designated by the Company as responsible for the security of the ship, including implementation and maintenance of the ship security plan, and for liaison with the company security officer and port facility security officers.
The duties and responsibilities of the SSO shall include- Maintaining and supervising the implementation of the SSP on- board (including any amendments to the plan)

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- Proposing modifications to the SSP
- Co- ordinating the implementation of the SSP with the SCO and the relevant PFSO.
- Carrying out regular security inspections of the ship to ensure appropriate security measures are maintained.
- Co- coordinating the security aspects of the handling of cargo and ship's stores with other crew and the relevant PFSO
- Promoting security awareness and vigilance among the crew members
- Reporting all security incidents.
- Ensuring adequate crew training is carried out
- Ensuring that security equipment is properly operated, tested, calibrated and maintained
- Reporting to the CSO any deficiencies and non- conformities and implementing any corrective actions on- board.

3.7 Company Security officer (CSO)

_1 The CSO is a person designated by the Company for ensuring that ship security assessment is carried out, that a ship security plan is developed, submitted for approval, and thereafter implemented and maintained, and for liaison with port facility security officers and the ship security officer.

1. The duties and responsibilities of the CSO include:
- Ensuring sufficient attention and resources are allocated to security and advising the level of threats likely to be encountered by the ship.
- Ensuring that the Ship Security Assessment are carried out by person with appropriate skills to evaluate the security of a ship.
- Modify the SSP to correct deficiencies and satisfy the security requirement of the individual ship.
- Ensuring adequate security training for personnel responsible for the security of the ship.
- Arranging for internal audits and reviews of security activities.

3.8 Port Facility Security Officer, (PFSO) is responsible for the development implementation, revision and maintenance of the port facility security plan and for liaison with the ship security officers and company security officers.

3.9 Vessel personnel with specific security duties

1. Vessel personnel with specific security duties shall be assigned security duties in support of the Facility Security Plan and should have sufficient knowledge and ability to perform their assigned duties, including as appropriate, - knowledge of current security threats and patterns; - recognition and detection of weapons,

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dangerous substances and devices; - recognition of characteristics and behavioral patterns of persons who are likely to threaten security; - techniques used to circumvent security measures;
- crowd management and control techniques;
- security related communications;
- Knowledge of the emergency procedures and contingency plans.

3.10 Facility Personnel with Specific Duties

1 Facility Personnel other than the FSO may be assigned specific security duties supporting the Facility Security Plan and should have
- working knowledge of maritime security terms and definitions
- knowledge of international maritime security policy and responsibilities of Governments/ Designated Authorities,
- RSOs, port facilities security officer and designated persons
- Knowledge of maritime security levels and their impact on security measures and procedures in the port facility and aboard ships
- Knowledge of security reporting procedures
- Knowledge of procedures for drills and exercises
- Knowledge of procedures for conducting inspections and surveys and for the control and monitoring of security activities specified in a port facility security plan
- Knowledge of security- related contingency plans and the procedures for responding to security incidents, including provisions for maintaining critical operations of port facility and ship/ port interface
- Knowledge of procedures for handling security- related information and security-related communications
- Knowledge of security documentation including the Declaration of Security

3.11 Other personnel

1 Besides the VSO and PFSO, other vessel and facility personnel may have a role in the enhancement of maritime security and should have knowledge and receive training, in some or all of the following, as appropriate.

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4. Ship Security Assessment

4. A Ship or Vessel Security Assessment (VSA) is an analysis that examines and evaluates the vessel and its operations taking into account possible threats, vulnerabilities, consequences, and existing protective measures, procedures and operations.
This Assessment (VSA) shall be carried out for each Indian- registered ship Covered by the ISPS Code and is an essential and integral part of the process of developing and updating the Ship Security Plan.

4.2 On- scene Security Surveys

1 Preparations required prior to an On- scene Survey.
Since on-scene (i.e. on board) security survey covers the security aspects of the vessel being surveyed, it is vital that the items to be surveyed are kept in readiness.
The On-Scene Security Survey is an integral part of any SSA that examines and evaluates existing shipboard protective measures, procedures and operations.

4.3 Security aspects of vessel layout

In order obtain and record the information required for conducting a security assessment, it is necessary to refer to the general layout or general arrangement plan of the ship from which one can know

- The location of areas which should have restricted access, such as navigation bridge, machinery spaces and other control stations
- The location and function of each actual or potential access point to the ship;
- Cargo spaces and stowage arrangements;
- The locations of the ships stores and where essential maintenance equipment is stored;
- The locations where unaccompanied baggage is stored;
- Location of the emergency and stand-by equipment to maintain essential services;
- Existing security and safety equipment for the protection of passengers and ships personnel;
- Escape and evacuation routes and assembly stations which have to be maintained to ensure the orderly and safe emergency evacuation of the ship ; lighting, access control and other appropriate systems.

5. Divided the survey into the following sections:-
- Physical Security
- Structural Integrity

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- Personnel Protection Systems
- Procedural Policies
- Radio and Telecommunication Systems
- Other Areas

6 Structural integrity for vessels and other structures
The subdivision of passenger ships into watertight compartments must be such that after assumed damage to the ship's hull the vessel will remain afloat and stable.

Requirements for watertight integrity and bilge pumping arrangements for passenger ships are also laid down as well as stability requirements for both passenger and cargo ships.

7. **Components and operations of systems to protect vessel personnel**

In order to protect ships personnel and the vessel from attack it is necessary to keep a watch for and prevent the bringing of instruments of destruction on board. Further, it is likely that the attacker will try to smuggle his weapons on board. If, for instance, a gun is smuggled on board in a dismantled condition it is unlikely that normal crew on board will be able to recognize it. It is therefore important that the ship's personnel have a basic knowledge of these weapons and what they look like.

8. Role of proper procedures in preventing and mitigating security incidents.
When there is a security threat, the ship may be advised of security level by the Administration where the port facility is located. If the ship is operating at security level 1 and the master or SSO considers that there exists a security threat, appropriate action must be taken to mitigate the threat. The master or SSO should also report the threat to the Administration and Contracting Government of the port facility.

Where there is a breach of security, the master should:
- Activate ship security alert system,
- Have the crew on emergency stations,
- Report to the Contracting Government of the port facility,
- Prepare to abandon ship,
- Prepare to leave the port
- Follow the Contingency Response Plan for whatever the threat is, for example Hijack, Bomb Threat, Unidentified Object/ Explosive on Ship, Bomb Threat/ Damage, Destruction to Port Facility, Pirate or Stowaway or whatever.

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9 Use of information technology and communications systems in vessel operations and in maintaining security with regard to ISPS, communication between the ship and outside stations can be done by ship security alert system whereby an alert is sent directly to the company or a competent authority designated by the Administration. Such an alert would indicate the ship's identity, its location and that her security is under threat or has been compromised. The security alert is not sent to other ships, does not raise any alarm on-board the ship and continues until deactivated and/ or reset.

The ship security alert system shall:

- Be capable of being activated from the navigation bridge and in at least one others location; and
- Conform to performance standards not inferior to those adopted by the Organization.
- Shall be so designed so as to prevent the inadvertent initiation of the security alert.

The requirement for a ship security alert system may be complied with by using the radio installation fitted for compliance with the requirements of SOLAS provided all requirements of the ISPS Code are complied with. When an Administration receives notification of a ship security alert, that Administration shall immediately notify the State (s) in the vicinity of which the ship is presently operating.

When a Contracting Government receives notification of a ship security alert from a ship which is not entitled to fly its flag, that Contracting Government shall immediately notify the relevant Administration and, if appropriate, the State (s) in the vicinity of which the ship is presently operating.

Additionally, there is GMDSS is installed on board as communication system. There is also a portable transceiver for on board communication. Communication may be made verbally, or by using load speaker and transceiver. For security related communication, the master can specify the frequency to be used.

10 Areas that may, if damaged or used for illicit observation, pose a risk to persons, property, or operations aboard the vessel or within a port facility. If a ship is at a port of a State which this Code does not apply or, is interfacing with fixed or floating platforms or a mobile drilling units on locations outside the purview of this code or, is interfacing with a port or port facility which is not required to comply with chapter XI-2 and part A of this Code, the ship can come across areas that may, if damaged or used for illicit observation, pose a risk to persons, property, or

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operations within the ship or the port facility.

11 Identification of vulnerabilities in the above areas and the preparation of counter measures to address them

12 The importance of having in place emergency plans to deal with contingencies.

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5. Security Equipment

1 Security equipment and systems

Before, the only method of ensuring security was physical examination of people and baggage and cargo etc. with large and quick movement of persons and cargoes now taking placing and the increasingly sophisticated methods of smuggling contraband into ships and planes. It is no more possible to ensure security through physical inspection alone. In order to detect and nab today's smugglers highly sophisticated detection equipment is necessary. Besides sniffer dogs, there are electronic sniffing devices, x-ray machines, walk through arches, explosive detection systems (eds) and other baggage and container screening devices used at port and airport entry points.

5.3 Testing, calibration and maintenance of security equipment and systems.

- The SSO is responsible for the storage, testing, calibration, maintenance of and control of all shipboard security equipment.

EXPLOSIVE DETECTION SYSTEMS (EDS)

EXPLOSIVE DETECTION SYSTEMS (EDS)

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6. Threat Identification, Recognition, and Response

6.1 Recognition and detection of weapons, dangerous substances and devices. Threats to a ship can be varied and change of rapidly. The ship's location, the time of the day, or international events can dramatically alter the threat to a ship. It is therefore necessary for the SSO to regularly monitor events to determine potential threats during the passage of a ship from port to port.

1. To preempt a terrorist attack it is necessary that the instruments of destruction are prevented from getting on board. It is likely that the terrorist may try to smuggle them in an unrecognizable dismantled condition so it is necessary that the personnel on board have at least a basic knowledge of these instruments and what they look like. An AK 47 assault rifle is a particular favorite with terrorists and this is what it looks like

AK 47 ASSAULT RIFLE

6.2 Physical searches and non- intrusive inspections Physical Searches are best carried out in booths as privacy minimizes embarrassment and increased effectiveness. People being searched should not be given the opportunity of selecting a particular searcher. One person (a supervisor) should observe people waiting and note suspicious behavior and allocate passengers to available searchers to ensure no over- loading.

Baggage Screening. Metal detectors are of little use for screening baggage and personal belongings since most bags and brief-cases have locks, hinges and other metal components which would result in a very high alarm rate. Moreover, hand-held detectors have a limited depth of effective penetration.

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AK 47

AK 56

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HAND GRENADES

CARBINE

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DETONATORS

EXPLOSIVE POWDER

6.3 Execution and coordination of searches

1. The importance of planning a search and the practice of carrying out searches as a drill.

A ship's security plan should incorporate a search procedure aimed at ensuring that the vessel can be searched quickly and effectively when this is considered necessary. The master of each ship, together with the ship's security officer, should be responsible for establishing search procedures.

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In the interests of good security, as well as good ship husbandry as much gear as possible should be stowed away.

3 Equipment the search team should carry for conducting a search.

The search team should be familiar with the list of basic equipment that may be employed in conducting searches. This list includes

- Flashlights and batteries;
- Screwdrivers, wrenches and crowbars;
- Mirrors and probes;
- Gloves, hard hats, overalls and non-slip footwear;
- Plastic bags and envelopes for collection of evidence;
- Forms on which to record activities and discoveries.

5 Places of concealment on board a vessel Searches should bear in mind that weapon and other dangerous devices may be intentionally placed to match its context as a means of disguise, such as a toolbox in an engine room. Participants in the search should be acquainted with the fact that there are many places on board a vessel where weapons, dangerous substances, and devices can be concealed.

Some of these are

Within cabins and offices

Companionways

Toilet and showers

Deck

Engine room

Galleys and Stewards' stores

6.4 Recognition, on a non-discriminatory basis, of persons posing potential security risks

1. General characteristics and behavioral patterns of persons who are likely to threaten security Ship's personnel should learn to recognize suspicious patterns of behavior, while realizing the importance of Examples of suspicious behaviors include;

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- Unknown persons photographing vessels or facilities.
  Unknown persons attempting to gain access to vessels or facilities.
- Individuals establishing businesses or roadside food stands either adjacent or in proximity to facilities.
- Unknown persons loitering in the vicinity of vessels or port facilities for extended periods of time.
- Vehicles with personnel in them loitering and perhaps taking photographers or creating diagrams of vessels or facilities.
- General aviation aircraft operating in proximity to vessels or facilities.
- Persons who may be carrying bombs or participating in suicide squad activities.
- Unknown persons attempting to gain information about vessels or facilities by walking up to personnel or their V families and engaging them in a conversation.
- Vendors attempting to sell merchandise.
- Workmen trying to gain access to vessels to repair, replace, service, or install equipment.
- E-mails attempting to obtain information regarding vessels, personnel, or standard operating procedures.
- Package drop-offs/attempted drop-offs.
- Anti-national sentiments being expressed by employees or vendors.
- Anti-national pamphlets or flyers distributed to employees or placed on windshields in parking lots.
- Out-of-the-ordinary phone calls.
- Recreational boaters or persons aboard refugee craft posing as mariners in distress to attract assistance from other vessels.

2. In order that the points above are noticed and suspicious persons recognized as such it is of utmost importance that the ship's personnel be observant continuously.

6.5 Techniques used to circumvent security measures

1. Summarizes the techniques that may be used to circumvent security measure Ship's personnel must be made aware that no security equipment or measure is infallible. They should also know that there are techniques that can be employed to evade, security systems and controls, and circumvent security

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measures such as the disabling of alarm systems, picking of locks, jamming of radio signals, etc.

6.6 Crowd management and control techniques

1. Basic psychology of a crowd in a crisis situation

A crowd is a large gathering of personnel at a specific place with one singular point of attraction or aim. Ports and passenger ships will at times be faced with situations where they are required to deal with crowds. Unorganized movement of a crowd could endanger the safety of the vessel, crows members and property and individuals in the vicinity.

Therefore it is absolutely necessary that crowds are 1 controlled. Facility crowd management therefore, has the primary responsibility for assuring safe conditions in compliance with applicable statutes and reasonable standards.

Cruise ships are places where people gather in hordes. And this huge milling causes unwanted problems and situations. The concept of crowd control has emerged as a solution to this problem and crowd control management essentially forms a part of the effective management of risks and emergencies involved in cruise ships.

Crowd safety, is not just about trying to merely control the crowd, it involves using the right kind of communication and effectuating proper leadership skills to manage a crowd. This is why the crowd control safety program has been recommended by the STCW stipulations.

Inform Passengers in Case of Emergency

Information to passengers must be given high priority

Officers and crew must be prepared for stress reactions from passengers and crew members

The information must be controlled

The crew must be better informed than the passengers.

Officers and crew must never lose their credibility

They must introduce themselves (name and title) and keep their voices under control.

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They must talk slowly and clearly and inform without being talkative.

Technical language must be avoided.

The messages must agree with what the passengers themselves are experiencing.

Report everything that the passengers can perceive or understand themselves.

Do not make light of real risks. Passengers may suspect that the truth is being kept from them. Therefore, tell what has happened

- ❖ Give them an appraisal of the situation
- ❖ Give details about what measures have been taken
- ❖ State the expected outcome
- ❖ State whether the situation has been reported ashore
- ❖ Point out that the crew is trained for the task and that the passengers must follow their instructions
- ❖ Give information frequently
- Every 10 to 15 minutes during an active phase.
- Every half hour or hour during a more stable phase.
- Restrict yourself to instructions and information only.
- Specify the precise time for the next announcement and keep the time punctually.
- Repeating previous information is also informative.
- Uncertainly is the worst state.
- Help passengers find their relatives and travel companions.

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7. Ship Security Actions

7.1 Actions required by different security levels

There are three security levels

Security Level 1 means the level for which minimum appropriate protective security measures shall be maintained at all times.

Security Level 2 means the level for which appropriate additional protective security measures shall be maintained for a period of time as a result of heightened risk of a transportation security incident.

Security Level 3 means the level for which further specific protective security measures shall be maintained for a limited period of time when a transportation security incident is probable or imminent, although it may not be possible to identify the specific target.

1 The three security levels and the actions required for each level.

LEVEL 1-- NORMAL LEVEL

- In normal level, both ships and port operations are carried out in general way.
- Minimum security measures are always maintained on board and in port.
- Ship and port operations are carried out as per ship and port facility security plans.
- Port facility ensures to keep the 'no access' areas under surveillance at all times.
- Ship and port authorities mutually supervise loading and unloading operations of cargo and stores, ensuring access control and other minimum security criteria.
- Minimum access in the ship is maintained at all times.

LEVEL 2 – Heightened Risk

In level 2, the threat to the security is higher than the normal level.

All the routine and cargo operations are carried out with an increase in security measures in both ships and ports.

Look outs in no access zones and waterside areas are to be increased by port and

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ship authorities.

Access control is maintained all the time with escorting the visitors and use of security equipment like metal detector etc.

Communication between port authority and ship administration is always maintained in case of increase in security level.

Preparing a full or partial search operation of ship.

A declaration of security is undertaken between port, state and ship administration.

LEVEL 3 – Imminent danger

Level 3 is imposed when the probability of a security threat to the ship or port authority is at the highest or imminent and specific protective measures are to be maintained.

In level 3 all ship and port operations are stopped and frequent security rounds and duties are carried out by both ship staff and port authorities. Boat patrols are done by port state on the water side.

Main propulsion plant is always kept ready for moving the ship out of port if required.

No personnel is allowed to access the ship without the authorization of port state official.

Only one access point is maintained on board at all times.

Preparing a full search operation of ship or under water hull search operation with port facility.

Preparation for evacuation of ship by its staff.

A declaration of security is undertaken between port state and ships administration.

7.2 maintaining security of the vessel/port interface

1 Prior to entering a port, the ship shall confirm that the port is subject to the IPS code and hold the Port Facility Security Plan. When the port has a Port Facility Security Plan, the CSO or SSO shall liaise with the PFSO and confirm the security level of both side. When a Declaration of Security is required by Contraction

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Government or PFSO, the master shall instruct SSO to prepare this Declaration of Security. When the ship has a higher security level than that of the port facility, the master shall inform this fact * Contraction Government and PFSO, and require him to prepare a Declaration of Security to coordinate the appropriate Security actions. When the port does not hold Port Facility Security Plan the ship shall liaise with Contracting Government, inform them the ship's Security level, and require appropriate security measures. The ship shall request the port to prepare a Declaration of Security.

A ship has to give her security level (SL 1,2 or 3) 24 hours before arrival in port. It is the designated authority of the government of the flag state that decides about the SL of its ships. The master of the ship can take extra security measures if he wants, but he cannot put his SL on a higher level. Only emergency safety measures can overrule he security measures provided in the SSP (ship Security Plan). If the SL of the port facility is higher than that of the ship, then the SSO (Ship Security Officer) has the obligation to equalize the security level of the ship when the ship has a higher security level than that of the port facility, the SSO together with the PFSO (Port Facility Security Officer) have to make up a DOS (Declaration of Security).

It is the designated authority of the government f the port that decides about the SL of the port facilities in the port area. The Security measures for each SL are written in the PFSP (Port Facility Security Plan).

The security measures are more severe when the SL is higher and also depend on the risk that can be encountered at the port facility. For instance a dangerous goods terminal, a passenger terminal or a container terminal will be fenced and guarded. An open bulk terminal, with no dangerous commodities, will only be fenced and guarded on the ship/shore interface when we have an SL 2 or 3. At security level 1 we have business as usual, without any economic constraints.

Requirements Unique to the United States

In THE United States, the Coast Guard requires that each vessel and port facility owner or operator ensure procedures are established for requesting a DoS and for handling DoS requests from the interfacing entity. A DoS must be completed with regard to any interface involving a cruise ship or a manned vessel carrying Certain Dangerous Cargoes in bulk. For interfaces involving a cruise ship or a manned vessel carrying Certain Dangerous Cargoes in bulk , the security needs and procedures are to be coordinated and agreed prior to arrival and the DoS is to be signed by both the ship and the port facility or another vessel prior to

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commencement of passenger embarkation/disembarkation or cargo operation. At Maritime Security (MARSEC) level 2 or 3, the security needs and procedures are to be coordinated and agreed prior to arrival and the DoS is to be signed by other the ship and the port facility or another vessel for all interfaces involving a manned vessel and either a port facility or another vessel. The port facility owner or operator must ensure that, in the event of a charge in the MARSEG level, any ships moored at the facility and any ships scheduled to arrive within 96 hours are promptly notified of change and that the DoS are revised as necessary.

Control Measures

Failure of the ship to complete a DoS when it has interfaced with a port facility or other ship subject to, but in violation of, the ISPS Code or Chapter XI-2 of the SOLAS convention constitutes clear grounds for a port state control official of a Contracting government to exercising control measures with regard to the ship. Control measures utilized must proportionate, but may involve:

(1) Inspection of the ship:4
(2) Delaying the ship;
(3) Detention of the ship;
(4) Restriction of operations, including movement within the port; or
(5) Expulsion of the ship from port. For ships intending to enter a port of a Contracting Government, where there are clear grounds for believing that the ship is in violation of the ISP XI-2 of the SOLAS Convention, the port state control officials may:
(a) Require rectification of non-compliance prior to entry;
(b) Require that the ship proceed to a specified location in the territorial sea or internal waters of the nation;
(c) Inspect the ship in the territorial sea of the nation; or
(d) Deny entry into the port. If control measures are exercised, the port state control officials must forthwith inform in writing the flag Administration of the control measures imposed and the reasons there of. The port state control officials must also inform the recognized security organization (RSO), if any, and the international Maritime organization (IMO) when control measures have been imposed.

Denial of entry into port or expulsion from port may only be imposed where the port state control officials have clear grounds to believe that the ship poses an immediate threat to the security or safety of personas or of ships or other

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property and there are no other appropriate means for removing that threat.

Summary

Proper use of the DoS is important, not only as a means of coordinating security arrangements between ships and port facilities, but also as a method of documenting appropriate implementation of the ISPS code and related maritime security requirements. This becomes crucial when a ship calls at a port facility that is not in full compliance with the ISPS Code and does not have and an approved security plan. A ship calling at such a port facility must not only institute additional security measures (as provided for in the ISPS Code and its ship security plan), but it must also to demonstrate to port state control officials at subsequent , port call that it took the appropriate steps. The way to demonstrate this full compliance with the ISPS code is to complete and retain on board a DoS fully documenting the ship's security measures while at this non-compliant port facility. Welcome to the new world of security through paperwork.

7.4 Execution of security procedures

1 Vessel Security Officer to carry out regular security Inspections which shall include, but are not limited to:

- Maintaining and supervising the implementation of the Ship Security plan, including any amendments to the plan; (Sample of Ship Security Plan conform to ISPS Code).
- Co-coordination the security aspects of the handling of cargo and ship's stores with other shipboard personnel and with the relevant PFSO;
- Proposing modifications to the Ship Security Plan;
- Reporting to the CSO any deficiencies and non-conformities identified during internal audits, periodic reviews, security inspections and verifications of compliance and implementing any corrective actions;

The SSO should address the following elements on board or within the ship:

- Physical Security;
- Structural Integrity;
- Personnel Protection Systems;
- Procedural Policies;
- Radio and telecommunication system, including computer system and

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networks; and
- Other areas that may, if damaged or used for illicit observation, pose a risk to
- Persons, property, or operations on board the ship or within a port facility.

Ensure the performance of all vessel security duties.

2 Security measures and procedures at the three security levels

Access to the ship

At security level 1, the SSP should establish the security measures to control access to the ship, where the following may be applied:

1 check the identity of all persons seeking to board the ship and confirm their reasons for doing so by checking, for example, joining instructions, passenger tickets,

2 in liaison with the port facility the ship should ensure that designated secure areas are established in which inspections and searching of persons, baggage (including carry-on items), personal effects, vehicles and their contents can take place;

3 in liaison with the port facility the ship should ensure that vehicles destined to be loaded car carriers, ro-ro and other passenger ships are subjected to search prior to loading, in accordance with the frequency required in the SSP;

4 segregate checked persons and their personal effects from unchecked persons and their personal effects;

5 segregate embarking from disembarking passengers;

6 identify access points that should be secures or attended to prevent unauthorized access;

7 secure, by locking or other means, access to unattended spaces adjoining areas to which passengers and visitors have access; and

8 provide security briefings to all ship personnel on possible threats, and establish procedures for reporting suspicious persons, objects or activities and emphasize the need for vigilance.

At security level 1, all those seeking to board a ship should be liable to search. The frequency of such searches, including random searches, should be specified in the

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approved SSP and should be specifically approved by the Administration. Such searches may best be undertaken by the port facility in close proximity to it. Unless there are clear security grounds for doing so, members of ship's personnel should not be required to search their colleagues or their personal effects. Any such search shall be undertaken in a manner which fully takes into account the human rights of the individual and preserves their basic human dignity.

At security level 2, the SSP should establish the security measures to be applied to protect against a heightened risk of a security incident to ensure higher vigilance and tighter control, which may include:

1 assigning additional personnel to patrol deck areas during silent hours to deter unauthorized access;

2 limiting the number of access points to the ship, identifying those to be closed and the means of adequately securing them;

3 deterring waterside access to the ship, in liaison with the port facility, providing boat patrols;

4 establishing a restricted area on the shore – side of the ship, in close co-operation with the port facility;

5 increasing the frequency and detail of searches of persons, personal effects, and vehicles being embarked or loaded onto the ship;

6 escorting visitors on the ship;

7 providing additional specific security briefings to all ship personnel on any identified threats, re-emphasizing the procedures for reporting suspicious persons, objects, or activities and stressing the need for increased vigilance; and

8 carrying out a full or partial search of the ship.

Security Level 3

At security level 3, the ship should comply with the instructions issued by those responding to the security incident or threat. The SSP should detail the security measures which could be taken by the ship, in close co-operation with those responding and the port facility, which may include:

- Limiting access to a single, controlled, access point;
- Granting access only to those responding to the security incident or threat;
- Directing of persons on board;

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- Suspension of embarkation or disembarkation;
- Suspension of cargo handling operations, deliveries etc;
- Evacuation of the ship;
- Movement of the ship; and
- Preparing for a full or partial search of the ship.

Embarkation of persons and their effects

- Searches of personnel seeking to board ship are conducted at the discretion of the SSO, in accordance with the applicable Security level. Persons refusing to comply with this policy will be denied access to the ship. Searches can be random and shall be undertaken by the port facility in close cooperation with the ship and in close proximity to it.
  (Note: The Company should set a frequency for these searches at each Security Level.
- All items brought on board the ship are/subject to control, monitoring, inspection and search.
  Persons refusing to comply with this policy will be denied access to the ship.
- Everyone boarding the ship, including visitors, contractors, and crew are subject to be checked for the carriage of weapons, ammunition, incendiaries and explosives, narcotics and paraphernalia.
- Carry-on articles will be inspected in accordance with the applicable Security Level.
- A designated secure area on board or in liaison with a port facility is established to conduct inspections and screening of people, baggage (including carry-on items), personal effects, vehicles and the vehicles contents.
- Ship personnel are not required to engage or be subjected to screening, or the person or of personal effects, by other ship personnel, unless security clearly requires it. Any such screening must be conducted in a way that takes into full account individual human rights and preserves the individual's basic human dignity.
- In liaison with the port facility, ensure a defined percentage of vehicles to be loaded aboard car carriers, RO-RO and passenger ships are screened prior to loading {The company should assign what percentage is appropriate}
- Checked persons and personal effects are segregated from unchecked

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persons and personal effects.

- In liaison with the port facility, ensure that all unaccompanied vehicles to be loaded on passenger ships are screened prior to loading.
- Monitor restricted areas to ensure only authorized persons have access.

Restricted areas shall only be accessed by ship's company;

Restricted areas shall only be accessed by ship's company shore staff, contractors, vendors, and other visitors as authorized by the Master. All restricted areas are secured by means of door lock keypad, the combination of which is changed quarterly and after every dry and wet dock availability period. Combinations are only issued to personnel authorized access to these restricted spaces. All other areas without such locks are to be secured by means of key lock. Access to keys is permitted to only authorized personnel.

Monitor deck areas and areas surrounding the vessel The ship should have the capability to monitor the ship, the restricted areas on board and areas surrounding the ship.

Such monitoring capabilities may include use of:

- Lighting;
- Watch-keepers, security guards and deck watches including patrols; and automatic intrusion detection devices should activate an audible and/or visual alarm at a location that is continuously attended or monitored. The SSP should establish the procedures and equipment needed at each security level and the means of ensuring that monitoring equipment will be able to perform continually, including consideration of the possible effects of weather conditions or of power disruptions.

Security Level 1

At security level 1, the SSP should establish the security measures to be applied which may be a combination of lighting, watch keepers, security guards or use of security and surveillance equipment to allow ship's security personnel to observe the ship in general, and barriers and restricted areas in particular.

The ship's deck and access points to the ship should be illuminated during hours of darkness and periods of low visibility while conducting ship\port interface activities or at a port facility or anchorage when necessary. While underway, when necessary, ships should use the maximum lighting available consistent with safe

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navigation, having regards to the provisions of the International Regulations for the Prevention of Collisions at Sea in force. The following should be considered when establishing the appropriate level and location of lighting:

- The ship's personnel should be able to detect activities beyond the ship, on both the shore side and the waterside;
- Coverage should include the area on and around the ship;
- Coverage should facilitate personnel identification at access points; and
- Coverage may be provided through coordination with the port facility.

Security Level 2

At security level 2, the SSP should establish the additional security measures to be applied to enhance the monitoring and surveillance capabilities, which may include:

- Increasing the frequency an detail of security patrols;
- Increasing the coverage and intensity of lighting or the use of security and surveillance and equipment;
- Assigning additional personnel as security lookouts; and
- Ensuring coordination with waterside boat patrols, and foot or vehicle patrols on the shore-side, when provided.

Additional lighting may be necessary to protect against a heightened risk of a security incidents. When necessary, the additional lighting requirements may be accomplished by coordinating with the port facility to provide additional shore side lighting.

Security Level 3

At security level 3, the ship should comply with the instructions issued by those responding to the security incident or threat thereof. The SSP should detail the security measures which could be taken by the ship, in close co-operation with those responding and the port facility, which may include:

- Switching on of all lighting, or illuminating the vicinity of the ship;
- Switching on of all on board surveillance equipment capable of recording activities, or in the vicinity of the ship;
- Maximizing the length of time such surveillance equipment can continue to record;

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- Preparation for underwater inspection of the hull of the ship; and initiation of measures, including the slow revolution of the ship's propellers, if practicable, to deter underwater access to the hull of the ship.

Security aspects of cargo handling and of vessel stores.

The security measures relating to cargo handling should:

- Prevent tampering; and
- Prevent cargo that is not meant for carriage from being accepted and stored on board the ship.

The security measures, some of which may have to be applied in liaison with the port facility, should include inventory control procedures at access points to the ship. Once on board the ship, cargo should be capable of being identified as having been approved for loading onto the ship. In addition, security measures should be developed to ensure that cargo, once on board, is not tampered with.

Security Level 1
At security level 1, the SSP should establish the security measures to be applied during cargo handling, which may include

- Routine checking of cargo, cargo transport units and cargo spaces prior to, and during, cargo operations;
- Checks to ensure that cargo being loaded matches the cargo documentation;
- ensuring, in liaison with the port facility, that vehicles to be loaded on board car carriers, ro—ro and passenger ships are subjected to search prior to loading, in accordance with the frequency required in the SSP; and
- checking of seals or other methods used to prevent tampering Checking of cargo may be accomplished by the following means:
- visual and physical examination; and
- using scanning/detection equipment, mechanical device, or dogs.

When there are regular, or repeated, cargo movements the CSO or SSO may, in consultation with the port facility, agree arrangements with shippers or others responsible for such cargoes covering off- site checking, sealing , scheduling, supporting documentation, etc. Such arrangements should be communicated to the agreed with the PFSO concerned.

Security Level-2
At security level 2, the SSP should establish the additional security measures to be applied during cargo handling, which may include:

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- detailed checking of cargo, cargo transport units and cargo spaces;
- intensified checks to ensure that only the intended cargo is loaded;
- intensified searching of vehicles to be loaded on car- carriers, ro-ro and passenger ships; and
- increased frequency and detail in checking of seals or other methods used to prevent tampering.

Detailed checking of cargo may be accomplished by the following means:

- increasing the frequency and detail of visual and physical examination;
- increasing the frequency of the use of scanning/detection equipment, mechanical devices, or dogs; and
- co-ordinating enhanced security measures with the shipper or other responsible party in accordance with an established agreement and procedures.

Security Level 3

At security level3 , the ship should comply with the instructions issued by those responding to the security incident or threat thereof. The SSP should detail the security measures which could be taken by the ship, in close co-operation with those responding and the port facility, which may include:

- suspension of the loading or unloading of cargo; and
- verifying the inventory of dangerous goods and hazardous substances carried on board, if any, and their location.

The security measures relating to the delivery of ship's stores should:

- ensure checking of ship's stores and package integrity;
- prevent ship's stores from being accepted without inspection;
- prevent tampering ; and
- prevent ship's stores form being accepted unless ordered. For ships regularly using the port facility it may be appropriate to establish procedures involving the ship, its suppliers and the port facility covering notification and timing of deliveries and their documentation. There should always be some way of confirming that stores presented for delivery are accompanied by evidence that they have been ordered by the ship.

Security Level 1

At security level1 , the SSP should establish the security measures to be applied during delivery of ship's stores, which may include:

- checking to ensure stores match the order prior to being loaded on board; and
- ensuring immediate secure stowage of ship's stores.

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Security Level 2
At security level 2, the SSP should establish the additional security measures To be applied during delivery of ships stores by exercising checks

Prior to receiving stores on board and intensifying inspections.

Security Level 3
At security level 3, the ship should comply with the instructions issued by those responding to the security incident or threat thereof. The SSP should detail the security measures which could be taken by the ship, in close co-operation with those responding and the port facility, which may include:

- subjecting ship's stores to more extensive checking;
- preparation for restriction or suspension of handing of ship's stores; and
- refusal to accept ship's stores on board the ship.

Security Communication must be readily available
Procedures and equipment for communicating responses to security threats and communicating with port, port state, and flag State must be readily available at all times Security Personnel must have ready access to communications to transmit electronic notices of arrival, crew lists, certificates and records, as well as maintenance of a continuous ship to port security communications to various authorities ship to flag, ship to shore, SSO to security personnel etc. Appropriate and timely communication is essential during an emergency. The ERP(Emergency response Plan) should identify clear communication channels within the ship and externally. As part of your ERP, the vessel should maintain internal and external notification lists that contain information on all appropriate entities to be contacted, including their names, titles, mailing addresses, e-mail addresses, all applicable land line and cellular phone numbers, and these lists should be updated as necessary. In a major event (e.g. a terrorist attack), it may not be possible to use normal channels of communication.

Provisions need to be made for an efficient and fail-safe form of communication to be available during conditions when the use of normal means may not be possible. An effective two-way communication system with the CSO is to be provided so that any unlawful act against the ship or person can be reported immediately using the appropriate format and must provide the following information:

- Location of ship (Lat/ Long/ Time)
- Name 7 Nationality/ Dates and Place of Birth of Victim
- Name /Nationality/Dates and Place of Birth of Person(s) committing

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unlawful act.
- Nature and extent of severity of injuries sustained ,if any.
- VHF radios are employed as the primary means of communication, with ship intercom/phone used as a backup

Maintain radio contact during operations:
- Within the ship---- radio contact will be maintained between bridge or control room for al ingress and egress points.
- Between ships--- radio contact will be maintained between ships in port at all times to relay security concerns.
- Between ship and port---radio contact will be maintained between Port personnel and Company Representatives at all times to relay security concerns.

Privately owned, hand held radio communication devices are not authorized for use on board this ship. Failure to comply will result in confiscation and retention of radio.

Distress and Duress: Procedures for indicating that the SSO or Security Officer is in distress, or is communicating under duress are the responsibility of the SSO. Appropriate ship's personnel are trained in these procedures.
Communications with terminal operator's personnel will be coordinated through the ship's agent with preference given to VHF radio and/or telephone. For security purposes, direct communications links are established between ship personnel and the security personnel in the port facility.

Those links are subject to periodic testing and failure to maintain communication is to be reported to the SSO.

SSOs communicate directly with the CSO, via telephone or e-mail as necessary to co-ordinate shipboard security operations and support requirements, and provide updated port contact information.

- Ship's Call Sign
- Satcom Numbers: Telephone:
- Fax: Telex:
- IMO No:

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8. Emergency Preparedness, Drills and Exercises

General----- Drills and exercises must test the proficiency of vessel personnel in assigned security duties at all Security Levels and the effective implementation of the Ship Security (SSP). They must enable the Ship Security Officer(SSO) to identify any related security deficiencies that need to be addressed.

- The SSO must ensure that at least one/ security drill is conducted at least every 3 months, except when a vessel is out of service due to repairs or seasonal suspension of operation, provided that in such cases a drill must be conducted within one week of the vessel's reactivation. Security drills may be held in conjunction with non-security drills where appropriate.

8.1 Execution of contingency plans

Contingency Planning. An essential part of security is the preparation of contingency plans in response to incidents which could occur and the planning of measures introduced in response to any increase in the level of threat. These plans need to cover different levels of response from the company (operator/ owner) and the master, officers and crew. They might also encompass the establishment of a " Threat Level" procedure, identifying various measures which might be adopted by vessels in response to the perceived level of threat to the vessel in a vessels in response to the perceive level of threat to the vessel in a particular place, at a particular time.

1 Action in case of a breach of security

Respond to security threats or breaches of security and maintain critical ship and ship-to-facility interface operations, including:

- Prohibit entry into affected area;
- Deny access to the ship, except to those responding to the emergency;
- Stop cargo-handling operations; and I
- Notify shore side authorities or other ships of the emergency;

2 Contingency plans for :

Hijacking-is the forcible seizure of a means of transport by terrorist or criminal group as a way of furthering their cause, reaching their objective, making good

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their escape or even using the ship itself, and/or its cargo, as a threat or as weapon. Aircraft have been hijacked by a single person armed only with imitation weapons and, in the right place one armed person could be enough on a ship. However, a planned terrorist hijack of a vessel is much more likely to involve a group with real weapons. The major task facing the would—be hijackers is to board the vessel with their weapons, and security measures aimed at preventing this should be introduced when the threat level warrants it. Measures devised in respect of threats from piracy or armed robbery should be appropriate.

The key objective must be to prevent unauthorized access to the vessel. Although in most parts of the world the threat of this kind of action is low, shipping companies and masters need to have a range of measures available to introduce as and when the threat level warrants it. Terrorists may seek to board a vessel by infiltration, ruse or assault. In each case the best defenses for both the deterrence and prevention of unauthorized access are crew awareness and control of access to the vessel and to key points on the vessel such as the bridge, engine room and communication facilities.

In port, if the threat warrants it, access points should be manned, in certain circumstances by two persons, who should be fully briefed on their duties, the action to take in the event of an incident or emergency and the planned response to an alarm. They need to be provided with a torch, a whistle to summon assistance and communications to remain to touch with the Duty Officer. They need to hold a full list of all crew members, shore officials and expected visitors. All visitors should be asked to identify. Strangers should be challenged. Vessels at anchor should regularly check anchor cables and hawse pipe covers. At sea, hijackers may try to gain access to the vessel, particularly close to land or in narrow waters where maneuverability is limited. Attempts Could be mounted from small boats, dhows, junks, fishing , boats that appear to have broken down or by any means that relies on the traditional assistance which seafarers offer each other. The best protection against this sort of ruse is an awareness of the possibilities and keeping a sharp look-out for small behaving suspiciously or approaching. Should a master decide to allow people to board, this should be one at a time , each one searched if necessary, while a good look-out is maintained on the other side of the ship. Particular care needs to be exercised during the hours of darkness when a surreptitious approach could be carried out more easily. When underway. If there is any doubt about the identity or motive of craft attempting to attract attention, their actions should be ignored. If it is safe to do so, and circumstances warrant it, speed

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should be increased and/or navigation lights and upper deck lighting extinguished. Attempts should be made to identify or photograph any craft behaving strangely and details reported ashore by the speediest means available. If another vessel approaches the ship at sea in a suspicious or threatening manner:

- Increase speed and alter course if sage to do so: give no opportunity for the other vessel to come alongside and make no response to messages by radio, light or loud hailer.
- Keep personnel clear of the upper deck.
- Note details of the other vessel and photograph it if possible.
- At night, direct searchlights at the approaching vessel and switch off upper deck lighting: if safe to do so, navigation lights should also be switched off.

Report details of any harassment to the company and, if appropriate, to a representative of the government claiming authority over the area. A terrorist assault is more likely to occur in harbor than at sea. If the measures recommended for controlling assess are in force and prove inadequate, it will demonstrate the determination and ruthlessness of the terrorists involved. Unless the terrorists are very poorly armed and equipped, no attempt should be made to resist an armed terrorist assault.

If despite all efforts at deterrence and prevention a vessel is hijacked, the master and crew should try, wherever possible, to prevent any loss of life.

❖ Bomb threat

Ships are vulnerable to explosive or incendiary devices:

❖ In accompanied passenger cars, freight vehicles or coaches
❖ In unaccompanied vehicles, export cars or semi- trailers
❖ In misdeclared cargo
❖ Carried on board by current passengers, or by those from a previous sailing leaving a timed device
❖ In luggage placed in a baggage trolley
❖ In ship's stores
❖ In the post
❖ Carried on board by shore workers in port
❖ Carried on board by contractor's personnel.

Travelling as a foot passenger, the saboteur has to contend with customs and

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immigration authorities, and with being challenged by ship's staff if he attempts to disembark prior to sailing. There is also the possibility that a determined terrorist may plant a device and remain on board.

In addition to bomb threats, the potential use of radiological, biological and chemical weapons against ships and the people on them, although unlikely, should also be considered.

- Unidentified objects/ explosives on vessel
- Covert entry and quick- plant device.
- The saboteur wishing to attack a ship alongside to cause specific damage or immobilize particular equipment may wish to board the ship undetected, plant an explosive or incendiary device and disembark before it detonates. Sabotage attacks differ from

- Hostage- taking attacks in that there are no negotiations over demands. If publicity is the saboteur's aim, it is likely that the incident will be "claimed" after the event.

Sabotage attacks of this sort are likely to be directed at the ship of a particular nationality, against the shipping company's policies, or the justification may be entirely local. Since saboteurs on this type of mission need to board and leave the ship without being detected, access control arrangements may not always deter them. To guard against this type of attack, vulnerable compartments should be locked and watch-keeping personnel should make random visits to look for signs of tampering. A saboteur need not only use explosive or incendiary devices, he may try to damage the vessel's machinery. Extra vigilance is needed immediately, prior to sailing, or following a bomb warning. Crew members should immediately be suspicious of unexpected objects in unusual places.

- Sabotage by remotely controlled or delayed action device-

The saboteur may use some convenient means of concealing and smuggling on board delayed- action bombs or incendiary devices in passenger's or crew's baggage, in deliveries of ship's stores or as misdeclared cargo. Crew members should be warned not to accept packages from strangers and made aware that devices could be introduced in seemingly innocent receptacles. Gas cylinders or oxygen bottles, for example, make ideal containers for explosive devices. Deliveries which have been cleared could be bound with colored tape for departmental identification, or automatically strapped using polypropylene strapping tape.

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Damage to/ destruction of facility

External sabotage- Major damage to a ship and facility can also be caused by a saboteur reaching the hull, either from another vessel or underwater and placing an explosive device in a vulnerable area. The saboteur's objectives in mounting such attacks can be block berths or narrow channels, or to immobilize a particular vessel or damage a facility. Such attacks require considerable knowledge and technical skill and lie within the capability of only fairly sophisticated terrorist groups. To be effective, some precision is required in placing the charges and this requires trained swimmers..

Preparedness and contingency planning measures to provide protection include:-

- Over-the- side lighting giving an even distribution of light on the whole hull and waterline;
- Keeping a good watch from the deck, to look out for bubbles (divers), floating refuse (which may hide swimmers) or small boats. All approaching boats should be challenged. If unidentified, they should be prevented from coming alongside;
- A boat patrol, carried out at frequent but irregular intervals and towing barbed wire or fish hooks, is an effective defense against frogmen or swimmers;
- If the ship is known to be under attack from swimmers, turning propellers ahead and astern turbulence in the water and makes swimming more difficult;
- If it is thought likely that a device has been fixed to the outside of the hull below the water-line, the assistance of local authorities should be sought.

Some of the above measures may seem fanciful or far-fetched, but they have all been used in the past with some success and are included to show the sort of protective measures which are needed when the threat demands it.

- Piracy and other depredations

The International Ship and Port Facility Security Code (ISPS) requires ships security assessments (SSA) and ships security plans (SSP) to be periodically reviewed, audited, and amended in response to experience or changing circumstances.

Recognizing that civilian and commercial vessels operating in pirate infested waters off Somalia or in the Gulf of Aden constantly take risk- based measures to mitigate the threat of pirate attacks and boarding's, it is recommended that as Counter Piracy Action Measures

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- Vessels in those areas operate at their fastest speeds (those operating under 16 knots with a low freeboard (less than six meters) should consider themselves at extremely high risk.
- Vessels that are unable to out run pirate vessels should change course repeatedly (consistent with safe navigation) and conduct night time transits.
- Vessels should take measures including, where necessary, changing their operational procedures to make it more difficult for pirates to board their vessels while underway.
- Obstacles should be placed in the way to prevent or delay the pirates gaining vessel control in the event that pirates board the vessel.

Examples may include safe- areas for crews to muster and physical barriers to control areas.

- Vessels to use appropriate non- lethal measures such as netting, wire, electric fencing, long- range acoustical devices, and fire hoses to prevent boarding.
- Vessels should take on properly certified unarmed security consultants on vessels transiting the region. Such consultants should be encouraged to provide security measures, including intelligence reports for vessels in transit, on-board training and non- lethal use of force capabilities, and night vision equipment.
- Vessels, in appropriate circumstances take on properly screened and certified third- party security providers with firearms, operating in compliance with applicable coastal, port, and flag State laws to provide an effective deterrent to pirate attacks off the Horn of Africa. Other self- protection measures to avoid detection, attack, boarding and hijack by pirates can be to:
  Stay outside high threat area, Navigate in rough seas, Continuous area- wide threat awareness, Circumnavigation, AIS and LRIT switched on, Military Convoy, Massive water Curtain, Speed > 18 knots, Razor wire/ Spikes Group transit, Ejectable obstacles (e.g. timber)

  Extra lookouts, Freeboard > 8 m Towed obstacles (alongside/ aft of ship), water HOSES Night Vision Goggles, Evasive Maneuvers, Laser guns, Sound blasters, Dummy lookouts, Restrict access, CCTV' Restrict movements inside, Personal Protection Gear Deny use of ship's tools, Deploy smokescreen inside Report movements to authorities Stowaways Ship owners and Masters face the problem of identifying the presence of stowaways before a ship leaves port or preventing their boarding the vessel in the first place.

However, most stowaways are only discovered once a vessel has sailed. Dealing

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with an incident involves the Master and owner in time consuming negotiations with club, agents and authorities. The cost alone from disruptions to the ship's schedule alone can be considerable.

There are a number of preventive measures the Master and crew can take before the ship enters port, during the stay in port and after departure. Therefore a thorough risk assessment should be considered; identifying the potential hazards present in the ship's area of operation, the physical surroundings of the ship upon loading! Discharging and potential hazards present on board the ship Vessel's surroundings and port areas Normally the ship owner has little or no influence on port security and has to concentrate on preventing stowaways from gaining access to the ship. Stowaways are typically able to gain access to the ship due to inadequate security and watch keeping, or, are hidden in containers which are subsequently loaded on board, while these are at the terminal.

As far as security and watch keeping inadequacy are concerned, a number of measures can be taken depending on the potential risk of stowaways in the particular port. The core strategy is to ensure that no unauthorized personnel are able to gain access to the ship, and that all those who have been authorized to board disembark before sailing. Given the pressure often put on watchmen, the best solution is to have two watch keepers at each entrance. However, with the small numbers of crew serving on modern ships this is usually not a feasible alternative, the choice being either to recruit local guards, or to arrange for the temporary attachment to the ship of a professional maritime security officer.

Engaging guards or a maritime security officer may seem extravagant. However, if the threat is considerable the costs involved could well be justified. Repatriation of stowaways also gain access to ships by hiding in containers, cars or other types of cargo units subsequently loaded on board. If the voyage is short the unit will probably be unloaded undisturbed, but more frequently the stowaways are discovered and ways have to be found to provide them with food and of releasing them.

The chances of discovering stowaways secreted away in cargo stored at the terminal will depend on the time available to undertake a thorough search and the amount of money the owner is prepared to spend.

Obviously not every container or car can be checked. Whilst soft top containers can be inspected quite easily, this is not the case with standard steel top containers.

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Sophisticated equipment is available to search for stowaways in containers; however, these gadgets are expensive and will normally be used by the port security authorities as opposed to ship owners and operators.

Port security- Many ports have adequate security; whilst at others security is non- existent. Whatever the circumstances, it is not recommended to rely solely on port security. The stowaway business is so financially attractive that to rely on local security staff merely offers an easy path for a potential stowaway. It is sensible, however, to ensure that the agent knows of your full intention not to sail with stowaways on board, and that he is repeatedly asked to ensure that all safety measures available at the port are mare to work in the interest of the ship.

The crew has little or no influence on port security and has to focus on preventing stowaways from gaining access to the ship. The high risk threat is from ports and terminals where the ISPS Code is not being implemented in a thorough manner. The task of preventing the stowaways from coming on board in these ports is more difficult and it is here that Masters and ship owners must focus their efforts. Crews should be issued the correct instructions and A procedures to enable the ship to provide a determined deterrent, and stopping stowaways from boarding.

Reducing the risk - port area

- Given the myriad of people who often surge on board when a ship arrives in port, a pass system can be of valuable assistance.
- Ask the agent if the port is capable of providing adequate security. If not, the agent can be asked to arrange additional protection.

Risk assessment and preventive measures

- If there are doubts as to the efficiency of locally supplied guards in ports where a large number/ of stowaways are known to board vessels, the short- term employment of a professional maritime security officer should be considered.

If stowaways are discovered during the search, the immigration authorities should be notified immediately in order that the stowaways can be removed from the ship.

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Reducing the risk- Access points

Review procedures to ensure that there is a watchman on duty at every access point which have to remain unlocked whilst the vessel is in port and that this watchman is familiar with the procedures when visitors, repairmen, stevedores etc., wish to come on board. The simple rule is: " no unauthorized personnel come on board, and all authorized personnel disembark before sailing". Check to ensure that all locks are locked and that places which cannot be locked are sealed with tamper- proof or wire seals.

Different harbors and ports have different access points that are commonly used. In general; some access point entries can be:

- Climbing the mooring ropes,
- Climbing from the sea using hooks,
- Boarding the vessel as stevedores with fake dock identification papers. At some ports stevedores are supposed to wear special clothing with branded overalls and helmets. Bear in mind that stowaways may have access to these overalls and helmets too.

Recent stowaway interviews have revealed that crew on board have also been involved in the safe passage of stowaways. On A some ships stowaways have had to pay a "ticket" to one of the crew on board. Consider offering financial rewards to those crew members who discover and prevent stowaway incidents and ensure that all crew members are aware of the advantages of preventing stowaways sailing with the ship. Check security equipment, close- circuit television, alarms and locks.

8.2 Security drills and exercises

1 Requirement for conducting drills and exercises.

- The Company Security Officer and The Ship Security Officer must have knowledge and have received training, taking into account the guidance given in Part B of the ISPS code.

Drill and exercise requirements

- General- Drills and exercises must test the proficiency of vessel personnel in assigned security duties at all Security Levels and the effective implementation of the Ship Security Plan (SSP). They must enable the Ship Security Officer (SSO) to identify any related security deficiencies that need to be addressed.

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Examples of drills include unauthorized entry to a restricted area, response to alarms, and notification of law enforcement authorities.

- ❖ If the vessel is moored at a facility on the date the facility has planned to conduct any drills, the vessel may, but is not required to, participate in the facility is scheduled drill.
- ❖ Drills must be conducted within one week whenever the percentage of vessel personnel with no prior participation in a vessel security drill on that vessel exceeds 25%.

Drills and Training for Rest of Ship's Crew

In addition to the specific training for personnel that are involved in implementing security actions, all of the ship's crew should receive security awareness training as part of their general orientation and training activities. This awareness training should issues such as:

- Limiting discussion about specifics of the ship (e.g., cargo, routes, equipment, crew size) with non---company personnel to those personnel that need to know in order to service the ship
- Reporting suspicious acts or behavior related to the ship both on/near the ship and when personnel are on shore leave
- Protection of company---supplied identification cards or other documentation A high level of awareness by company personnel of these simple measures can help prevent the ship from becoming an easy target.

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9. Security Administration

9.1 Documentation and records
Records should be available to duly authorized officers of Contracting Governments to verify that the provisions of the Ship Security Plans are being implemented.
Records may be kept in any format but should be protected from unauthorized access or disclosure. 1 documents that shall be available on board at all times Records of the following activities addressed in the Ship Security Plan must be kept on board at all times and be made available to the government authorities upon request for at least the time frame covering the previous 10 ports of call.
--Training , drills and Exercises;
--security threats and security incidents;
--breaches of security
--changes in security level;

Communications relating to the direct security of the ship such as specific threats to the ship or to port facilities the ship is in, or has been;
--internal audits and reviews of security activities;
--periodic review of the Ship Security Assessment;
--periodic review of the Ship Security Plan;
--implementation of any amendments to the plan; and
--maintenance, calibration and testing of security equipment, if any including testing of the ship security alert system.

- Annual internal audits of the SSP. For each annual audit, a letter certified by the SSO stating the date the audit was completed
  --Annual periodic reviews of the SSA and the SSP maintained.
  --Required security records must be protected from unauthorized access or disclosure.
  --Records must be kept in the working language or languages of the ship or translation in either English, French or Spanish.
  --Security related records required under the international requirements and any additional records specified by a classification society shall be kept for 5 years to allow ' internal audit review and to provide evidence of program compliance for periodic verification.

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10. Anti - Piracy

Risk Awareness: - Prior to entering area of risk

10.1 Appraise the strength and vulnerabilities of crew and ships

Prior to transiting the high Risk Area, ship operators and Masters should carry out a through Risk Assessment to assess the likelihood and consequences of piracy attacks to the vessel, based on the latest available information. The output of the Risk Assessment should identify measures for prevention, mitigation and recovery, which will mean combining statutory regulations with supplementary measures to combat piracy. It is important that the Risk Assessment is ship and voyage specific, and not generic.

10.2 Know the Anti-Piracy Measure

Factors to be considered in the Risk Assessment should include, but may not be limited to, the following:

10.2.1- Crew Safety

- The primary consideration should be to ensure the safety of the crew. Care should be taken, when formulating measures to prevent illegal boarding and external access to the accommodation, that crew members will not be trapped inside and should be able to escape in the event of another type of emergency, such as, for example fire.
- Careful consideration should be given to the location of a Safe Muster Point of Citadel. (See Section 8.13)
- Consideration should also be given to the ballistic protection afforded to the crew who may be required to remain on the bridge during a pirate attack, recognizing that pirates increasingly fire at the bridge of a vessel to try to force it to stop. (See section 8.3)

10.2.2 – Freeboard

- It is likely that pirates will try to board the ship being attacked at the lowest point above the waterline, making it easier for them to climb onboard. These points are often on either quarter or at the vessel's stern.
- Experience suggests that vessels with a minimum freeboard that is greater than 8 metres have a much greater chance of successfully escaping a piracy attempt than those with less.
- A large freeboard will provide little or no protection if the construction of the

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ship provides access to pirates seeking to climb onboard, and thus further protective measures should be considered.

10.2.3-Speed

- One of the most effective ways to defeat a pirate attack is by using speed to try to outrun the attackers and /or make it difficult to board.
- To date, there have been no reported attacks where pirates have boarded a ship that has been proceeding at over 18 knots. It is possible however that pirate tactics and techniques may develop to enable them to board faster moving ships.
- Ships are recommended to proceed at Full Sea Speed, or at least 18 knots where they are capable of greater speed, throughout their transit of the High Risk Area.
- It is very important to increase to maximum safe speed immediately after identifying any suspicious vessel and as quickly as possible in order to try to open the CPA (Closest Point of Approach) from any possible attackers and /or make the vessel more difficult to board.
- If a vessel is part of a 'Group Transit'(see section 7.9 for further details of Group Transits) within the Internationally Recommended Transit Corridor(IRTC), speed may be required to be adjusted.
- It is recommended that reference should be made to the MSCHOA, NATO Shipping Centre and MARLO websites for the latest threat guidance regarding pirate attack speed capability.

10.2.4 – Sea State

- Pirates mount their attacks from very small craft (skiffs), even where they are supported by larger vessels or Motherships which tends to limit their operations to moderate sea states.
- It is likely to be more difficult to operate small craft effectively in sea state 3 and above. A large freeboard alone may not be enough to deter a pirate attack.

10.3 Understanding the contents of the Best Management Practices(BMP)

The purpose of the Industry Best Management Practices (BMP) is to assist ships to avoid , deter or delay piracy attacks in the High Risk Areas. Experience and data collected shows that the practices content in the BMP can and will make a significant difference in preventing a ship becoming a victim of piracy. The potential consequence of not following BMP can be severe. There have been instance of pirates subjecting their hostages to violence and other ill treatment. The average length of a hijacking of vessel and her crew is over 7 months.

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For the purposes of the BMP the term piracy includes all acts of violence against ships, her crew and cargo. This includes armed robbery and attempts to board and take control of the ship, wherever this may take place. Somali pirates have to date, sought to hijack a vessel, her cargo and crew and hold them until a ransom demand is paid. Not all ship Protection Measures discussed in BMP4 may be applicable to every ship type.

Some of the salient points to remember as per BMP:-

1) Do not be Alone:- Use the Internationally recommended Transit corridor (IRTS) and group transit scheme or independent convoy & keep AIS turned on.
2) Do not be detected :- Keep track of NAVWARNS and visit relevant websites for known pirate operating location. Use navigation lights only.
3) Do not be Surprised :- Increased vigilance-lookouts, CCTV and Radar
4) Do not be Vulnerable :- Use visible (deterrent) and physical (preventive) ship protection measures. These could include: Razor wire, use of water foam etc. Provide additional personal protection to bridge teams.
5) Do not be Boarded : - Increase to maximum speed & maneuver vessel.
6) Do not Controlled :- Follow well practiced procedures and drills. Deny use of tools, equipment, access routes

10.4 Pirates business module

- The pirates always carry out surprise attacks and catch the vulnerable vessels unaware when such vessels are under prepared to repel pirate attacks. Commonly, two small high speed (up to 25 knots) open boats or 'Skiffs' are used in attacks, often approaching from either quarter or the stern. Skiffs are frequently fitted with 2 outboard engines or a larger single 6hp engine.
- Pirate Action Groups operate in a number of different boat configurations. To date whatever the configuration the attack phase is carried out by skiffs. Pirate Action Group boat configurations include:
  - Skiffs only- usually two
  - Open whalers carrying significant quantities of fuel often towing 2 or more attack skiffs.
  - Motherships which have included the very largest of merchant ships, fishing vessels and dhows.
- These Motherships have been taken by the pirates and usually have their own crew onboard as hostages. Motherships are used to carry pirates, stores, fuel and attack skiffs to enable pirates to operate over a much larger area and are significantly less affected by the weather. Attack skiffs

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are often towed behind the Motherships. Where the size of the Mothership allows it, skiffs are increasingly being carried onboard and camouflaged to reduce chances of interdiction by Naval/ Military forces.

- Increasingly, pirates use small arms fire and Rocket Propelled Grenades(RPGs) in an effort to intimidate Masters of ships to reduce speed and stop to allow the pirates to board. The use of these weapons is generally focused on the bridge and accommodation area. In what are difficult circumstances, it is very important to maintain Full Sea Speed, increasing where possible, and using careful maneuvering to resist the attack
- Somali pirates seek to place their skiffs alongside the ship being attacked to enable one or more armed pirates to climb onboard. Pirates frequently use long lightweight ladders and ropes, or a long hooked pole with a knotted climbing rope to climb up the side of the vessel being attacked. Once onboard the pirate (or pirates) will generally make their way to the bridge to try to take control of the vessel. Once on the bridge the pirate/pirates will demand that the ship slows/stops to enable further pirates to board.
- Attacks have taken place at most times of the day. However, many pirate attacks have taken place early in the morning, at first light. Attacks have occurred at night, particularly clear moonlit nights, but night time attacks are less common.
- The majority of piracy attacks have been repelled by ship's crew who have planned and trained in advance of the passage and applied the BMPs.

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11 Pirate Attack

11.1 Examine the implication of piracy attack

If the crew of a vessel suspects that it is coming under a pirate attack there are specific actions that are recommended to be taken during the approach stage and the attack stage. It should be noted that the pirates generally do not use weapons until they are within two cables of a vessel, therefore any period yup until this stage can be considered as ' approach', and gives a vessel valuable time in which to activate her defenses and make it clear to pirates that they have been seen and the vessel is prepared and will resist. Once under pirate attack with a fear of siege the crew may face following situation:-

- Extreme fear, shock and panic
- Sense of physical vulnerability
- Fight amongst crew members
- State of Shock

Statistics have been gathered to understand how people have reacted in crisis situation in all walks of life. There is no specific research currently available for piracy related incidents but it is envisaged that reactions experienced are likely to be broadly similar. It is stated that in an emergencies, human behavior may be categorized in three groups:-

- Group 1 :- 60% may do little, or may engage in appropriate behaviors, whilst awaiting the initiatives of others.
- Group 2 :- 25% may act rationally, perhaps attacking the threat, closing doors or warning others.
- Group 3 :- 15% may be almost totally paralyzed by the seriousness of the situation.

11.2 Assess how to defend the crew and the ship

11.2.1 Watch keeping and Enhanced Vigilance

Prior to entering the High Risk Area, it is recommended the preparations are made to support the requirement for increased vigilance by:

- Providing additional lookouts for each Watch. Additional lookouts should be fully briefed.
- Considering a shorter rotation of the Watch period in order to maximize alertness of the lookouts.

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- ❖ Ensuring that there are sufficient binoculars for the enhanced Bridge Team, preferably anti glare.
- ❖ Considering use of night vision optics.
- ❖ Maintaining a careful Radar Watch.

Well constructed dummies placed at strategic locations around the vessel can give an impression of great numbers of people on watch

11.2.2 Enhanced Bridge Protection

The bridge is usually the focus for any pirate attack. In the initial part of the attack, pirates direct weapons fire at the bridge to try to coerce the ship to stop. If they are able to board the vessel the pirates usually try to make for the bridge to enable them to take control. The following further protection enhancements might be considered:

- ❖ Kevlar jackets and helmets available for the bridge team to provide a level of protection for those on the bridge during an attack. (If possible, jackets and helmets should be in non-military color).
- ❖ While most bridge windows are laminated, further protection against flying glass can be provided by the application of security glass film, often called Blast Resistant Film.
- ❖ Fabricated metal, (steel/aluminum), plates for the side and rear bridge windows and the bridge wing door windows, which may be rapidly secured in place in the event of an attack.
- ❖ The after part of both bridge wings, (often open), can be protected by a wall of sandbags.
- ❖ The sides and rear of the bridge, and the bridge wings, may be protected with a double layer of chain link fence which has been shown to reduce the effect of an RPG round. Proprietary anti-RPG screens are also available.

11.2.3 control of Access to Bridge, Accommodation and Machinery Spaces

It is very important to control access routes to deter or delay pirates who have managed to board a vessel and are typing to enter accommodation or machinery spaces. It is very important to recognize that if pirates do gain access to the upper deck of a vessel they will be tenacious in their efforts to gain access to the accommodation section and in particular the bridge. It is strongly recommended that significant effort is expended prior to entry to the High Risk Area to deny the

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pirates access to the accommodation and the bridge.

- All doors and hatches providing access to the bridge, accommodation and machinery spaces should be properly secured to prevent them being opened by pirates.
- Careful consideration should be given to the means of securing doors and hatches in order to afford the ship the maximum protection possible.
- Where the door or hatch is located on an escape route from a manned compartment, it is essential that it can be opened by a seafarer trying to exit by that route. Where the door or hatch is locked it is essential that a key is available, in a clearly visible position by the door or hatch.
- It is recommended that once doors and hatches are secured, a designated and limited number are used for routine access when required, their use being strictly controlled by the door or hatch.
- Consideration should be given to blocking or lifting external ladders on the accommodation block to prevent their use, and to restrict external access to the bridge.
- Where doors and hatches are required to be closed for watertight integrity, ensure all clips are fully dogged down in addition to any locks. Where possible, additional securing such as with wire strops may enhance hatch security.
- Pirates have been known to gain access through portholes and windows. The fitting of steel bars to windows will prevent this even if they manage to shatter the window.
- Prior to entering the High Risk Area procedures for controlling access to accommodation, machinery spaces and store rooms should be set out and practiced.

11.2.4 Physical Barriers

Pirates typically use long lightweight hooked ladders, grappling hooks with rope attached and long hooked poles with a climbing rope attached to board vessels underway. Physical barriers should be used to make it as difficult as possible to gain access to vessels by increasing the height and difficulty of any climb for an attacking pirates.

- **Razor Wire**
  Razor wire (also known as barbed tape) creates an effective barrier but only

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when carefully deployed. The barbs on the wire are designed to have a piercing and gripping action. Care should be taken when selecting appropriate razor wire as the quality (wire gauge and frequency of barbs) and type will vary considerably. Lower quality razor wire is unlikely to be effective. Three main types of razor wire are commonly available:

- Unclipped (straight strand)
- Spiral (like a telephone cord) and
- Concertina (linked spirals).

11.2.5 Water Spray and Foam Monitors

The use of water spray and/or foam monitors has been found to be effective in deterring or delaying pirates attempting to board a vessel. The use of water can make it difficult for a pirates skiff to remain alongside and makes it significantly more difficult for a pirate to try to climb onboard. Options include:

- Fire hoses and foam monitors - Manual operation of hoses and foam monitors is not recommended as this is likely to place the operator in a particularly exposed position and therefore it is recommended that hoses and foam monitors (delivering water) should be fixed in position to cover likely pirate access routes. Improved water coverage may be achieved by using fire hoses in jet mode but by utilizing baffle plates fixed a short distance in front of the nozzle.
- Water cannons - These are designed to deliver water in a vertical sweeping arc thus protecting a greater part of the hull. Many of these have been developed from tank cleaning machines.
- Ballast pumps – Where possible to do so ships may utilize their ballast pumps to flood the deck with water thus providing a highly effective water curtain over the ship's side. This may be achieved by allowing ballast tanks to over-flow on to the deck, by using existing pipework when in ballast condition, or by retrofitting pipe work to allow flooding of the decks whilst in loaded condition. Care must be taken to ensure that ballast tanks are not over-pressurized causing damage to the hull and tanks, or vessel stability compromised. If in doubt it is recommended that the relevant Classification Society be contacted for advice.
- A Steam – Hot water, or using a diffuser nozzle to produce steam has also been found to be very effective in deterring attacks.
- A Water spray rails – some ships have Installed spray rails using a Glass

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Reinforced Plastic (GAP) water main, with spray nozzles to produce a water curtain to cover larger areas.

- A Foam can be used, but it must be in addition to a vessel's standard Fire Fighting Equipment (FEE) stock. Foam is effective as it is disorientating and very slippery making it difficult to climb through.

The following points are also worthy of note:

- Once rigged and fixed in position it is recommended that hoses and foam monitors are in a ready state, requiring just the remote activation of fire pumps to commence delivery of water.
- Where possible no maintenance should be carried out on the vessel's sea water systems whilst on passage in the High Risk Area. Note that in order to utilize all pumps additional power may be required and therefore these systems should also be ready for immediate use.
- Practice, observation, and drills will be required in order to ensure that the results achieved by the equipment, provide effective coverage of vulnerable areas.

11.2.6 Alarms

Sounding the ship's alarms/whistle serves to inform the vessel screw that a piracy attack has commenced and, importantly, demonstrates to any potential attacker that the ship is aware of the attack and is reacting to it. If approached, continuous sounding of the vessel's foghorn/whistle distracts the pirates and as above lets them know that they have been seen. It is important to ensure that:

- The piracy alarm is distinctive to avoid confusion with other alarms, potentially leading to the crew mustering at the wrong location outside the accommodation.
- Crew members are familiar with each alarm, Including the signal warning of an attack and an all clear, and the appropriate response to it.
- Exercises are carried out prior to entering the High Risk Area.

10.2 H) Maneuvering Practice

Practicing maneuvering the vessel prior to entry into the High Risk Area will be very beneficial and will ensure familiarity with the ship's handling characteristics and how to effect anti-piracy maneuvers whilst maintaining the best possible

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speed. (Waiting until the ship is attacked before practicing this is too late!)

11.2.7. Closed Circuit Television (CCTV)

Once an attack is underway and pirates are firing weaponry at the vessel, it is difficult and dangerous to observe whether the pirates have managed to gain access. The use of CCTV coverage allows a degree of monitoring of the progress of the attack from a less exposed position:

- Consider the use of CCTV cameras to ensure coverage of vulnerable areas, particularly the poop deck.
- Consider positioning CCTV monitors at the rear of the bridge in a protected position.
- Further CCTV monitors could be located at the Safe Muster Point/Citadel (see section 8.13)
- Recorded CCTV footage may provide useful evidence after an attack

11.2.8. Upper Deck Lighting

It is recommended that the following lights are available and tested:

- Weather deck lighting around the accommodation block and rear facing lighting on the poop deck, consistent with Rule 20(b) of the international Regulations for Preventing Collision at Sea.
- Search lights for immediate use when required.
- It is, however, recommended that ships proceed with just their navigation lights illuminated, with the lighting described above extinguished. Once pirates have been identified or an attack commences, illuminating the lighting described above demonstrates to the pirates that they have been observed.
- Navigation lights should not be switched off at night.

11.2.9. Approach Stage – If not already at full speed, increase to maximum to open the distance. Try to steer a straight course to maintain a maximum speed. Initiate the ship's pre-prepared emergency procedures.

- Activate the Emergency Communication plan
- Sound the emergency alarm and make a 'Pirate Attack' announcement in accordance with the Ship's Emergency Plan.
- Report the attack Immediately to authorities ashore.

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- Activate the Ship Security Alert System (SSAS). Which will alert your Company Security officer and Flag State. Make a 'Mayday' call on VHF Ch. 16.

11.2.10. Attack stage

- Reconfirm that all ship's personnel are in a position of safety.
- As the pirates close in on the vessel, Masters should commence small alteration of helm whilst maintaining speed to deter skiffs form lying alongside the vessel in preparation for a boarding attempt. These maneuver's will create additional wash to impede the operation of the skiffs.
- Substantial amounts of helm are not recommended, as these are likely to significantly reduce a vessel's speed.

11.3 Coping in a hostage situation

11.3.1 Deny Use of Ship's Tools and Equipment

Pirates generally board vessels with little in the way of equipment other than personal weaponry. It is important to try to deny pirates the use of ship's tools or equipment that may be used to gain entry into the vessel. Tools and equipment that may be of use to the pirates should be stored in a secure location.

Protection of Equipment Stored on the Upper Deck Small arms and other weaponry are often directed the vessel and are particularly concentrated on the bridge, accommodation section and poop deck.

- Consideration should be given to providing protection, in the form of sandbags or Kevlar blankets, to gas bottles (i.e. oxy-acetylene) or containers of flammable liquids that must be stored in these locations.
- Ensure that any excess gas bottles or flammable materials are landed prior to transit.

11.3.2 If the Pirates take Control

- Try to remain calm.
- Before the pirates gain access to the bridge, inform UKMTO. Ensure that the SSAS has been activated, and ensure that the AIS is switched on.
- Offer no resistance to the pirates once they reach the bridge. Once on the bridge the pirates are likely to be aggressive, highly agitated, and possibly under the influence of drugs (including khat, an amphetamine like

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stimulant), so remaining calm and cooperating fully will greatly reduce the risk of harm.

- If the bridge/engine room is to be evacuated the main engine should be stopped and all way taken off the vessel if possible (and if navigationally safe to do so). All remaining crew members should proceed to the designated Safe Muster Point with their hands visible.

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12. The Release Process

12.1 Discuss the additional danger associated with the release process.

❖ **On Board**

- The ship will sail to a safe port where criminal debriefing and other debriefs will be conducted.
- The Master or his replacement should take command of the vessel.
- The seafarers need to resume their normal onboard routines and duties.
- Seafarers should have direct communication with family members as soon as possible for just a short time which will allow all crew to call quickly.
- During this call seafarers should be encouraged not to talk about the piracy incident but about themselves and their families.
- Seafarers should receive medical care and be prescribed appropriate medication.
- The ship should be provided with disinfectants, cleaning materials and toiletries remembering to encourage the crew not to clean away forensic evidence.
- The seafarers should be provided with clothing.
- The Master should encourage crew to talk and share their feelings amongst themselves and if possible to make notes.

❖ **Post-Release Response Ashore**

The company should consider:

- Gathering together the crew.
- Providing interim hotel accommodation for the crew.
- Providing practical support such as haircuts, personal hygiene and clothing.
- Providing medical and emotional support.
- Arranging operational debriefs.
- Allowing further communication with families.
- Making available personnel trained to provide practical and emotional support.

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13. Sea Farers Family

13.1 Enables seafarers to consider what they may wish to share with their family concerning the risk of piracy

- The seafarers Family Possible Reactions during a Crisis are Confusion, Uncertainty, Worry, Fear, Anxiety, Shock, Anger, Distrust etc, Including concerns regarding financial situation, Family strife and loss of trust with the company.
- The reactions of the family following an attack or during a hostage situation are very similar to those of the seafarer. There will be a confusion fo information as for the first few days there may be little or no communication from the ship. This will lead to feeling of uncertainty, worry, fear, anxiety, shock, anger and loss of faith with the company. There will be need for credible information from the company and other support. It is important that the seafarers family is in contact and is supported by the company/agent at this time.
- Ensure that the family has the correct contact details of the company in the event of a piracy attack. Ensure that the company has the up-to –date family contact details.
- Seafarers and their families need to ensure that they have contact details of the company in the case of a piracy attack. They also need to make sure that the company has up to date family contact details.
- Seafarers should know of their legal rights and contractual entitlements during and after a period of piracy.

13.2 Discussion with participants and assessment.

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RIJEKA COLLEGE OF MARITIME STUDIES

IMO STANDARD MARINE COMMUNICATION PHRASES (SMCP)

Rijeka, September 2000

FOREWORD

As navigational and safety communications from ship to shore and vice versa, ship to ship , and on board ships must be precise, simple and unambiguous, so as to avoid confusion and error, there is a need to standardize the language used. This is of particular importance in the light of the increasing number of internationally trading vessels with crews speaking many different languages since problems of communication may cause misunderstandings leading to dangers to the vessel, the people on board and the environment.

In 1973 the IMO Maritime Safety Committee agreed at its twenty-seventh session that, where language difficulties arise, a common language should be used for navigational purposes and that language should be English. In consequence the Standard Marine Navigational Vocabulary (SMNV) was developed, adopted in 1977 and amended in 1985.

In 1992 the IMO Maritime Safety Committee at its sixtieth session instructed the IMO Sub-Committee on Safety of Navigation to develop a more comprehensive standardized safety language than the SMNV, 1985, taking into account the changing conditions in modern seafaring and covering all major safety-related verbal communications.

At its sixty-eighth session in 1997 the IMO Maritime Safety Committee adopted the Draft Standard Marine Communication Phrases (SMCP) developed by the IMO Sub-Committee on Safety of Navigation. The Draft SMCP, following international trials, was amended at the forty-sixth session of this Sub-Committee and final consideration given at the IMO Maritime Safety Committee at its [...] session in the light of remarks received by the Organization. The SMCP was adopted by the IMO Assembly in [...]as resolution A.([...]) .

Under the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as revised 1995, the ability to understand and use the SMCP is required for the certification of officers in charge of a navigational watch on ships of 500 gross tonnage or more.

IMO STANDARD MARINE COMMUNICATION PHRASES

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INTRODUCTION

1 Position of the SMCP in maritime practice

The Standard Marine Communication Phrases (SMCP) has been compiled:

- to assist in the greater safety of navigation and of the conduct of the ship,
- to standardize the language used in communication for navigation at sea, in port-approaches, in waterways, harbours and on board vessels with multilingual crews, and
- to assist maritime training institutions in meeting the objectives mentioned above.

These phrases are not intended to supplant or contradict the International Regulations for Preventing Collisions at Sea, 1972 or special local rules or recommendations made by IMO concerning ships' routeing, neither are they intended to supersede the International Code of Signals, and when applied in ship's external communication this has to be done in strict compliance with the relevant radiotelephone procedures as set out in the ITU Radio Regulations. Furthermore, the SMCP, as a collection of individual phrases, should not be regarded as any kind of technical manual providing operational instructions.

The SMCP meets the requirements of the STCW Convention, 1978, as revised, and of the SOLAS Convention, 1974, as revised, regarding verbal communications; moreover, the phrases cover the relevant communication safety aspects laid down in these Conventions.

Use of the SMCP should be made as often as possible in preference to other wording of similar meaning; as a minimum requirement users should adhere as closely as possible to their wording in relevant situations. In this way they are intended to become an acceptable safety language, using English for the verbal interchange of intelligence among individuals of all maritime nations on the many and varied occasions when precise meanings and translations are in doubt, increasingly evident under modern conditions at sea.

The accompanying CD/Cassette is designed to familarize users with the pronunciation of the phrases.

2 Organization of the SMCP

The SMCP is divided into External Communication Phrases and On-board Communication Phrases as far as its application is concerned, and into PART A and PART B as to its status within the framework of the STCW, 1978, as revised.
PART A covers phrases applicable in external communications and which may thus be regarded as the replacement of the Standard Marine Navigational Vocabulary, 1985, which is requested to be used and understood by the STCW Code, 1995, Table A-II/I. This part was enriched by essential phrases concerning shiphandling and safety of navigation to be used in on-board communications, particularly when the Pilot is on the bridge, as required by Regulation 14(4), Chapter V, SOLAS 1974, as revised.

PART B calls attention to other on-board standard safety-related phrases which, supplementary to PART A, may also be regarded useful for Maritime English instruction.

3 Position of the SMCP in Maritime Education and Training

The SMCP does not intend to provide a comprehensive Maritime English syllabus which is expected to cover a far wider range of language skills to be achieved in the fields of vocabulary, grammar, discourse abilities, etc., than the SMCP could ever manage.. However, PART A in particular, should be an indispensable part of any curriculum which is designed to meet the corresponding requirements of the STCW Convention, 1978, as revised. In addition, PART B offers a rich choice of situations covered by phrases well suited to meet the communication requirements of the STCW Convention, 1978, as revised, which are implicitly expected to be satisfied by mariners.

The SMCP should be taught and learnt selectively, according to the users` specific needs rather than completely. The respective instruction should be based on practice in the maritime environment and be implemented through appropriate modern language teaching methods.

4 Basic communicative features

The SMCP builds on a basic knowledge of the English language. It was drafted on purpose in a simplified version of Maritime English to reduce grammatical, lexical and idiomatic varieties to a tolerable minimum, using standardized structures for the sake of its function aspects, i.e. diminishing misunderstanding in safety related verbal communications, thereby endeavouring to reflect present Maritime English language usage on board vessels and in ship-to-shore/ship-to-ship communications.
This means, in phrases offered for use in emergency and other situations developing under considerable pressure of time or psychological stress as wells as in navigational warnings, a block language was applied which sparingly uses, or frequently omits, the function words *the, a/an, is/are* as done in seafaring practice. Users, however, may be flexible in this respect.

Further communicative features may be summarized as follows:

- avoiding synonyms
- avoiding contracted forms
- providing fully worded answers to "yes/no"-questions and basic alternative answers to sentence questions
- providing *one* phrase for *one* event, and
- structuring the corresponding phrases after the principle: *identical invariable plus variable.*

5 Typographical conventions

( ) **brackets** indicate that the part of the message enclosed within the brackets may be added where relevant;

/ **oblique strokes** indicate that the items on either side of the stroke are alternatives;

... **dots** indicate that the relevant information is to be filled in where the dots occur;

(*italic letters)* indicate the kind of information requested;

~ **tildes** stand for the invariable part of an aforementioned standard phrase which is followed by a variable addendum.

GENERAL

1 Procedure

When it is necessary to indicate that the SMCP are to be used, the following message may be sent:
"Please use Standard Marine Communication Phrases."
"I will use Standard Marine Communication Phrases."

2 Spelling

2.1 Spelling of letters

When spelling is necessary, only the following spelling table should be used:

Letter	Code	Letter	Code
A	Alfa	N	November
B	Bravo	O	Oscar
C	Charlie	P	Papa
D	Delta	Q	Quebec
E	Echo	R	Romeo
F	Foxtrot	S	Sierra
G	Golf	T	Tango
H	Hotel	U	Uniform
I	India	V	Victor
J	Juliet	W	Whisky
K	Kilo	X	X-ray
L	Lima	Y	Yankee
M	Mike	Z	Zulu

2.2 Spelling of digits and numbers

A few digits and numbers have a **modified** pronunciation compared to general English:

Number	Spelling	Pronunciation
0	zero	ZEERO
1	one	WUN
2	two	TOO
3	three	**TREE**
4	four	**FOWER**
5	five	FIFE
6	six	SIX
7	seven	SEVEN
8	eight	AIT
9	nine	**NINER**
1000	thousand	**TOUSAND**

3 Message Markers

In shore-to-ship and ship-to-shore communication or radio communication in general, the following eight Message Markers may be used (also see "**Application of Message Markers**" given in PART AI/6 "Vessel Traffic Service (VTS) Standard Phrases"):

(i) **Instruction**
(ii) **Advice**
(iii) **Warning**
(iv) **Information**
(v) Question
(vi) Answer
(vii) Request
(viii) Intention

4 Responses

4.1 When the answer to a question is in the affirmative, say:
"Yes, ... " - followed by the appropriate phrase in full.

4.2 When the answer to a question is in the negative, say:
"No, ..." - followed by the appropriate phrase in full.

4.3 When the information requested is not immediately available, say:
"Stand by" - followed by the time interval within which the information will be available.

4.4 When the information requested cannot be obtained, say:
"No information."

4.5 When an INSTRUCTION (e.g. by a VTS-Station, Naval vessel or other fully authorized personnel) or an ADVICE is given, respond if in the affirmative:
"I will/can ... " - followed by the instruction or advice in full; and,
if in the negative, respond:
"I will not/cannot ... " - followed by the instruction or advice in full.

Example: "ADVICE. Do not overtake the vessel North of you."
Respond: "I will not overtake the vessel North of me."

4.6 Responses to orders and answers to questions of special importance both in external and on-board communication are given in wording in the phrases concerned.

5 Distress, urgency and safety signals

5.1 MAYDAY to be used to announce a distress message

5.2 PAN - PAN to be used to announce an urgency message

5.3 SÈCURITÈ to be used to announce a safety message

6 Standard organizational phrases

6.1 "How do you read (me)?"

6.1.1 "I read you ...

bad/one	with signal strength one	(i.e. barely perceptible)
poor/two	with signal strength two	(i.e. weak)
fair/three	with signal strength three	(i.e. fairly good)
good/four	with signal strength four	(i.e. good)
excellent/five	with signal strength five	(i.e. very good)

6.2 When it is advisable to remain on a VHF Channel / frequency say:
"Stand by on VHF Channel ... / frequency ... "

6.2.1 When it is accepted to remain on the VHF channel / frequency indicated, say:
"Standing by on VHF Channel ... / frequency ... "

6.3 When it is advisable to change to another VHF Channel / frequency, say:
"Advise (you) change to VHF Channel ... / frequency ... ."
"Advise(you) try VHF Channel .. / frequency... ."

6.3.1 When the changing of a VHF Channel / frequency is accepted, say:
"Changing to VHF Channel ... / frequency ... ."

7 Corrections

When a mistake is made in a message, say:
"Mistake ..." - followed by the word:
"Correction ... " plus the corrected part of the message.

Example: "My present speed is 14 knots - mistake.
Correction, my present speed is 12, one-two, knots."

8 Readiness

"I am / I am not ready to receive your message".

9 Repetition

9.1 If any part of the message are considered sufficiently important to need safeguarding, say:
"Repeat ... " - followed by the corresponding part of the message.

Example: "My draft is 12.6 repeat one-two decimal 6 metres."
"Do not overtake - repeat - do not overtake."

9.2 When a message is not properly heard, say:
"Say again (please)."

10 Numbers

Numbers are to be spoken in separate digits:
"One-five-zero" for 150
"Two decimal five" or
Two point five" for 2.5

Note: Attention! When rudder angles e.g. in wheel orders are given, say:
"Fifteen" for 15 or
"Twenty" for 20 etc..

11 Positions

11.1 When latitude and longitude are used, these shall be expressed in degrees and minutes (and decimals of a minute if necessary), North or South of the Equator and East or West of Greenwich.

Example: "WARNING. Dangerous wreck in position 15 degrees 34 minutes North 061 degrees 29 minutes West."

11.2 When the position is related to a mark, the mark shall be a well-defined charted object. The bearing shall be in the 360 degrees notation from true north and shall be that of the position FROM the mark.

Example: "Your position bearing 137 degrees from Big Head lighthouse distance 2.4 nautical miles."

12 Bearings

The bearing of the mark or vessel concerned, is the bearing in the 360 degree notation from north (true north unless otherwise stated), except in the case of relative bearings. Bearings may be either FROM the mark or FROM the vessel.

Examples: "Pilot boat is bearing 215 degrees from you."

Note: Vessels reporting their position should always quote their bearing FROM the mark, as described in paragraph 11.2 of this section.

12.1 Relative bearings

Relative bearings can be expressed in degrees relative to the vessel's head. More frequently this is in relation to the port or starboard bow.

Example: "Buoy 030 degrees on your port bow."
(Relative D/F bearings are more commonly expressed in the 360 degree notation.)

13 Courses

Always to be expressed in 360 degree notation from north (true north unless otherwise stated). Whether this is to TO or FROM a mark can be stated.

14 Distances

Preferably to be expressed in nautical miles or cables (tenths of a mile) otherwise in kilometres or metres, the unit always to be stated.

15 Speed

To be expressed in knots:

15.1 without further notation meaning speed through the water; or,

15.2.1.1 "ground speed" meaning speed over the ground.

16 Times

Times should be expressed in the 24 hour UTC notation; if local time will be used in ports or harbours it should clearly be stated.

17 Geographical names

Place names used should be those on the chart or in Sailing Directions in use.
Should these not be understood, latitude and longitude should be given.

18 Ambiguous words

Some words in English have meanings depending on the context in which they appear. Misunderstandings frequently occur, especially in VTS communications, and have produced accidents. Such words are:

18.1 The Conditionals "May", "Might", "Should" and "Could".

May
- Do not say: "May I enter the fairway?"
- Say: "QUESTION. Do I have permission to enter the fairway?"
- Do not say: "You may enter the fairway."
- Say: "ANSWER. You have permission to enter the fairway."

Might
- Do not say: "I might enter the fairway."
- Say: "INTENTION. I will enter the fairway."

Should
- Do not say: "You should anchor in anchorage B 3."
- Say: "ADVICE. Anchor in anchorage B 3."

Could
- Do not say: "You could be running into danger."
- Say: "WARNING. You are running into danger."

18.2 The word "Can"

The word "Can" either describes the possibility or the capability of doing something. In the SMCP the situations where phrases using the word "Can" appear make it clear whether a possibility is referred to. In an ambiguous context, however, say, for example:

"QUESTION. Do I have permission to use the shallow draft fairway at this time?",
do not say: "Can I use the shallow draft fairway at this time?", if you ask for a permission.
(The same applies to the word "May")

Note: In all cases the radiotelephone procedures as set out in the ITU - Radio Regulations have to be observed.

GLOSSARY

The GLOSSARY also includes a limited number of technical terms which do not appear in the text of the SMCP but might be useful in case the content of a given standard Phrase requires modification.

1 General terms

Abandon vessel	To evacuate crew and passengers from a vessel following a distress
Accommodation ladder	Ladder attached to platform at vessel's side with flat steps and handrails enabling persons to embark / disembark from water or shore
Adrift	Floating, not controlled, without a clearly determinable direction
Air draft	The height from the waterline to the highest point of the vessel
Assembly station	Place on deck, in mess rooms, etc., assigned to crew and passengers where they have to meet according to the muster list when the corresponding alarm is released or announcement made
Backing (of wind)	Shift of wind direction in an anticlockwise manner, in time (opposite of veering)
Beach (to)	To run a vessel up on a beach to prevent its sinking in deep water
Berth	1: A sea room to be kept for safety around a vessel, rock, platform, etc.. 2: The place assigned to a vessel when anchored or lying alongside a pier, etc.
Blast	A sound signal made with the whistle of the vessel
Blind sectors	Areas which cannot be scanned by the radar of the vessel because they are shielded by parts of its superstructure, masts, etc, or shore obstructions.
Boarding arrangements	All equipment, such as pilot ladder, accommodation ladder, hoist, etc., necessary for a safe transfer of the pilot
Boarding speed	The speed of a vessel adjusted to that of a pilot boat at which the pilot can safely embark / disembark
Bob-cat	A mini-caterpillar with push-blade used for the careful distribution of loose goods in cargo holds of bulk carriers
Briefing	Concise explanatory information to crew and/or passengers
Cable	1: Chain, wire or rope connecting a vessel to her anchor(s) 2: (measurement),185.2 metres, i.e. one tenth of a nautical mile
Capsizing	Turning of a vessel upside down while on water
Cardinal buoy	A seamark, i.e. a buoy, indicating the North, East, South or West, i.e. the cardinal points from a fixed point. such as a wreck, shallow water, banks, etc.

Cardinal points	The four main points of the compass, i.e. North, East, South and West; for the purpose of the SMCP the intercardinal points, i.e. Northeast, Southeast, etc., are also included
Casualty	here: Case of death in an accident or shipping disaster
Check (to)	1: To make sure that equipment etc. is in proper condition or that everything is correct and safe 2: To regulate motion of a cable, rope or wire when it is running out too fast
Close-coupled towing	A method of towing vessels through polar ice by means of icebreaking tugs with a special stern notch suited to receive and hold the bow of the vessel to be towed
Close up (to)	To decrease the distance to the vessel ahead by increasing one`s own speed
Compatibility(of goods)	states whether different goods can be stowed together in one hold
Convoy	A group of vessels which sail together, e.g. through a canal or ice
Course	The intended direction of movement of a vessel through the water
Course made good	That course which a vessel makes good over ground, after allowing for the effect of currents, tidal streams, and leeway caused by wind and sea
COW	Crude Oil Washing: A system of cleaning the cargo tanks by washing them with the cargo of crude oil during discharged
CPA/TCPA	Closest Point of Approach /Time to Closest Point of Approach limit as defined by the observer to give warning when a tracked target or targets will close to within these limits
Crash-stop	An emergency reversal operation of the main engine(s) to avoid a collision
Damage control team	A group of crew members trained for fighting flooding in the vessel
Datum	1. The most probable position of a search target at a given time 2. The plane of reference to which all data as to the depth on charts are referenced.
Derelict	Goods or any other commodity, specifically a vessel abandoned at sea
Destination	Port which a vessel is bound for
Disabled	A vessel damaged or impaired in such a manner as to be incapable of proceeding on its voyage
Disembark (to)	To go from a vessel

Distress alert (GMDSS)	A radio signal from a distressed vessel automatically directed to an MRCC giving position, identification, course and speed of the vessel as well as the nature of distress
Distress/ Urgency traffic	here: The verbal exchange of information on radio from ship to shore and/or ship to ship/ air craft about a distress / urgency situation as defined in the relevant ITU Radio Regulations
Draft	The depth of water which a vessel draws
Dragging (of anchor)	Moving of an anchor over the sea bottom involuntarily because it is no longer preventing the movement of the vessel
Dredging (of anchor)	Moving of an anchor over the sea bottom to control the movement of the vessel
Drifting	Floating, caused by winds and current with a determinable direction
Drop back (to)	To increase the distance to the vessel ahead by reducing one's own speed
DSC	Digital Selective Calling (in the GMDSS system)
Embark (to)	To go aboard a vessel
EPIRB	Emergency Position Indicating Radio Beacon
Escape route	A clearly marked way in the vessel which has to be followed in case of an emergency
Escort	Attending a vessel, to be available in case of need, e.g. ice-breaker, tug, etc..
ETA	Estimated Time of Arrival
ETD	Estimated Time of Departure
Fire patrol	A crew member of the watch going around the vessel at certain intervals so that an outbreak of fire may be promptly detected; mandatory in vessels carrying more than 36 passengers
Flooding	Major flow of seawater into the vessel
Fire monitor	Fixed foam/powder/water cannon shooting fire extinguishing agents on tank deck, manifold etc.
Foul (of anchor)	Anchor has its own cable twisted around it or has fouled an obstruction
Foul (of propeller)	A line, wire, net, etc., is wound round the propeller
Full speed	Highest possible speed of a vessel
Fume	Often harmful gas produced by fires, chemicals, fuel, etc.

General emergency alarm	A sound signal of seven short blasts and one prolonged blast given with the vessel´s sound system
GMDSS	Global Maritime Distress and Safety System
(D) GPS	(Differential)Global (satellite) Positioning System
Hampered vessel	A vessel restricted by her ability to manoeuvre by the nature of her work or her deep draft
Hatchrails	Ropes supported by stanchions around an open hatch to prevent persons from falling into a hold
Heading	The horizontal direction the vessel's bows at a given moment measured in degrees clockwise from north
Hoist	here: A cable used by helicopters for lifting or lowering persons in a pick-up operation
Icing	Coating of ice on an object, e.g. the mast or superstructure of a vessel
IMO-Class	Group of dangerous or hazardous goods, harmful substances or marine pollutants in sea transport as classified in the International Maritime Dangerous Goods Code (IMDG Code)
Inert (to)	To reduce the oxygen in an oil tank by inert gas to avoid an explosive atmosphere
Initial course	Course directed by the OSC or other authorized person to be steered at the beginning of a search
Inoperative	Not functioning
Jettison (to) (of cargo)	Throwing overboard of goods in order to lighten the vessel or improve its stability in case of an emergency
Launch (to)	To lower, e.g. lifeboats to the water
Leaking	Escape of liquids such as water, oil, etc., out of pipes, boilers, tanks, etc., or a minor inflow of seawater into the vessel due to damage to the hull
Leeward	The general direction to which the wind blows; opposite of windward
Leeway	The angular effect on the vessel's course caused by the prevailing wind
Let go (to)	To set free, let loose, or cast off (of anchors, lines, etc.)
Lifeboat station	Place assigned to crew and passengers where they must gather before being ordered into the lifeboats
List	here: Inclination of the vessel to port side or starboard side
Located	In navigational warnings: Position of object confirmed

Make water (to)	Seawater flowing into the vessel due to hull damage, or hatches awash and not properly closed
MMSI	Maritime Mobile Service Identity number
Moor (to)	To secure a vessel in a particular place by means of wires or ropes made fast to the shore, to anchors, or to anchored mooring buoys, or to ride with both anchors down
MRCC	Maritime Rescue Co-ordination Centre: Land-based authority responsible for promoting efficient organization of maritime search and rescue and for co-ordinating the conduct of search and rescue operations within a search and rescue region
Muster (to)	To assemble crew, passengers or both in a special place for purposes of checking
Muster list	List of crew, passengers and all on board and their functions in a distress or drill
Not under command	(abbr. NUC) A vessel which through exceptional circumstances is unable to manoeuvre as required by the COLREGs
Obstruction	An object such as a wreck, net, etc., which blocks a fairway, route, etc.
Off air	When the transmissions of a radio station etc., have broken down, been switched off or suspended
Off station (of buoys)	Not in charted position
Oil clearance	Oil skimming from the surface of the water
Operational	Ready for immediate use
Ordnance exercise	Naval firing practice
OSC	On-Scene Co-ordinator: A person designed to co-ordinate search and rescue operations within a specified area
Overflow	Accidental escape of oil from a tank which is full because pumping was not stopped in time
Polluter	A vessel emitting harmful substances into the air or spilling oil into the sea
Preventers	Ropes or wires attached to derricks to prevent them from swinging during cargo handling operations
Proceed (to)	To sail or head for a certain position or to continue with the voyage
PA-system	Public address system: Loudspeakers in the vessel's cabins, mess rooms, etc., and on deck through which important information can be broadcast from a central point, mostly from the navigation bridge

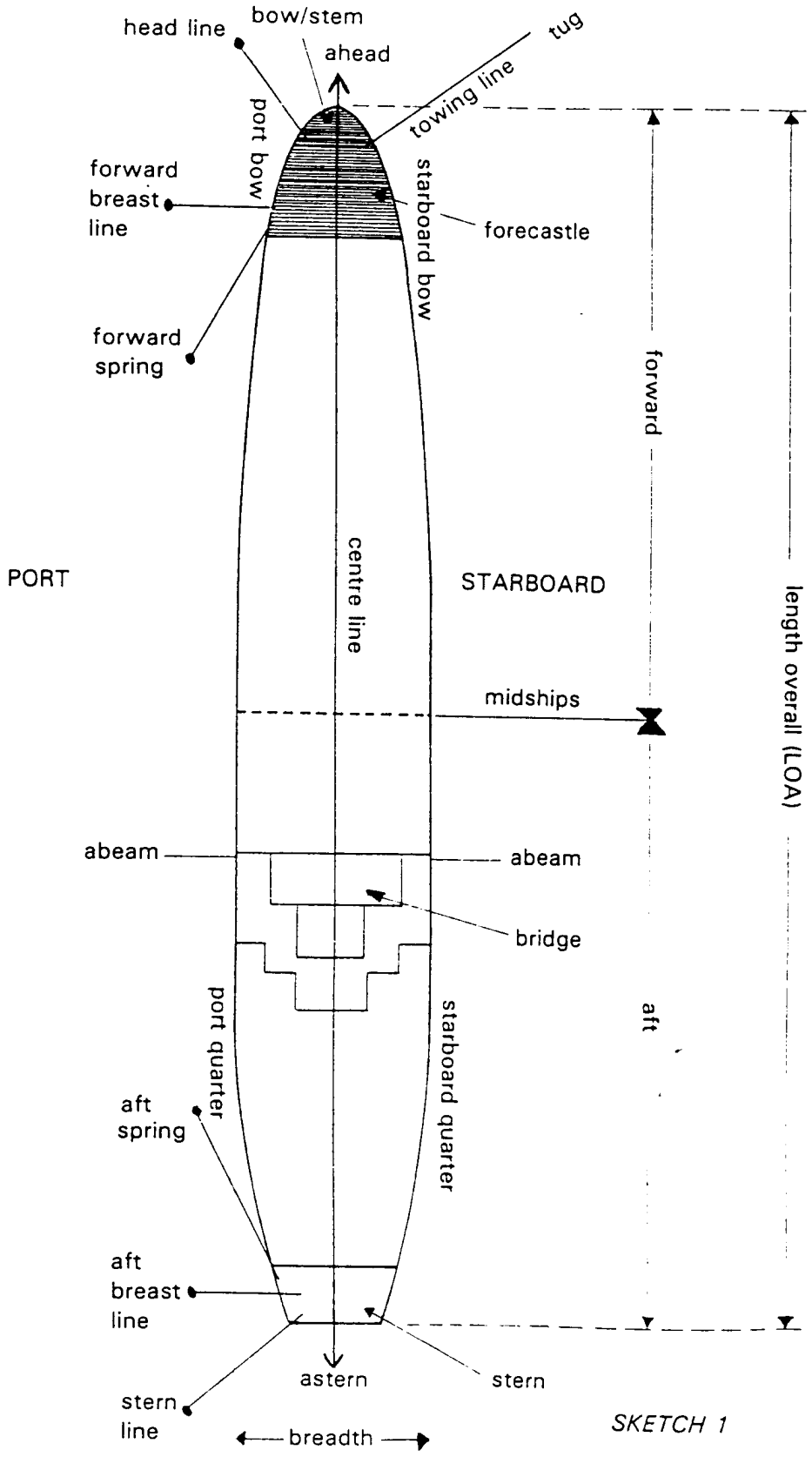
Recover (to)	Here: To pick up shipwrecked persons
Refloat (to)	To pull a vessel off after grounding; to set afloat again
Rendez-vous	An appointment between vessels normally made on radio to meet in a certain area or position
Reported	in navigational warnings: Position of object unconfirmed
Restricted area	A deck, space, area, etc., in vessels, where for safety reasons, entry is only permitted for authorized crew members
Resume (to)	here: To re-start a voyage, service or search
Retreat signal	Sound, visual or other signal to a team ordering it to return to its base
Rig move	The movement of an oil rig, drilling platform, etc., from one position to another
Roll call	The act of checking who of the passengers and crew members are present, e.g. at assembly stations, by reading aloud a list of their names
Safe speed	That speed of a vessel allowing the maximum possible time for effective action to be taken to avoid a collision and to be stopped within an appropriate distance
Safety load	The maximum permissible load of a deck, etc.
Safe working pressure	The maximum permissible pressure in cargo hoses
SAR	Search and Rescue
Scene	The area or location where the event, e.g. an accident has happened
Search pattern	A pattern according to which vessels and/or aircraft may conduct a co-ordinated search (the IMOSAR offers seven search patterns)
Search speed	The speed of searching vessels directed by the OSC
Seemark	An elevated object on land or sea serving as a guide …..
Segregation(of goods)	Separation of goods which for different reasons must not be stowed together
Shackle	Standard length (15 fathoms) of an anchor cable
Shifting cargo	Transverse movement of cargo, especially bulk, caused by rolling or a heavy list
Slings	Ropes, nets, and any other means for handling general cargoes
Speed of advance	The speed at which a storm centre moves

Spill (to)	The accidental escape of oil, etc., from a vessel, container, etc., into the sea
Spill control gear	Special equipment for fighting accidental oil spills at early stages
Spreader	here: Step of a pilot ladder which prevents the ladder from twisting
Stand by (to)	To be in readiness or prepared to execute an order; to be readily available
Stand clear (to)	here: To keep a boat away from the vessel
Standing orders	Orders of the Master to the officer of the watch which s/he must comply with
Stand on (to)	To maintain course and speed
Station	The allotted place or the duties of each person on board
Stripping	Draining tanks of the remaining cargo, water, etc.
Survivor	A person who continues to live in spite of being in an extremely dangerous situation, e.g. a shipping disaster.
Take off (to)	A helicopter lifts off from a vessel's deck
Target	The echo generated e.g. by a vessel on a radar screen
Tension winch	A winch which applies tension to mooring lines to keep them tight
TEU	Twenty Foot Equivalent Unit (standard container dimension)
Track	The path followed, or to be followed, between one position and another
Transit	here: The passage of a vessel through a canal, fairway, etc.
Transit speed	Speed of a vessel required for the passage through a canal, fairway, etc.
Transshipment (of cargo)	here: The transfer of goods from one vessel to another outside harbours
Underway	A vessel which is not at anchor, or made fast to the shore, or aground
Union purchase	A common method of cargo handling by combining two derricks, one of which is fixed over the quay, the other over the hatchway
Unlit	When the light characteristics of a buoy or a lighthouse are inoperative
UTC	Universal Time Co-ordinated (ex GMT)
Variable (of winds)	When a wind is permanently changing the direction from which it blows
Veering (of winds)	Shifting of wind direction in a manner, in time; opposite of backing
Veer out (to)(of anchors)	To let out a greater length of cable

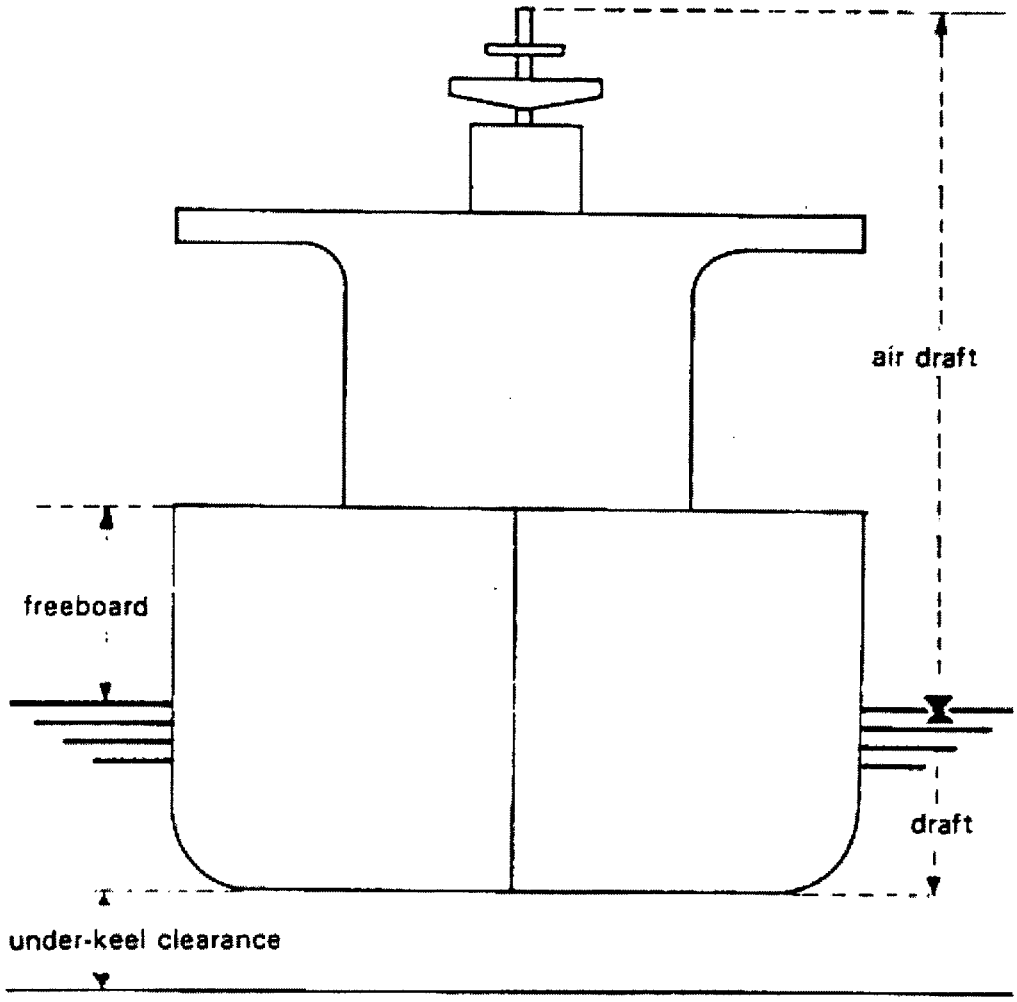
VHF	Very High Frequency (30 - 300 MHz)
Walk out (to) (of anchors)	To reverse the action of a windlass so as to ease the cable
Way point	A position a vessel has to pass or at which she has to alter course according to her voyage plan
Windward	The general direction from which the wind blows; opposite of leeward
Wreck	A vessel which has been destroyed or sunk or abandoned at sea

2 VTS special terms

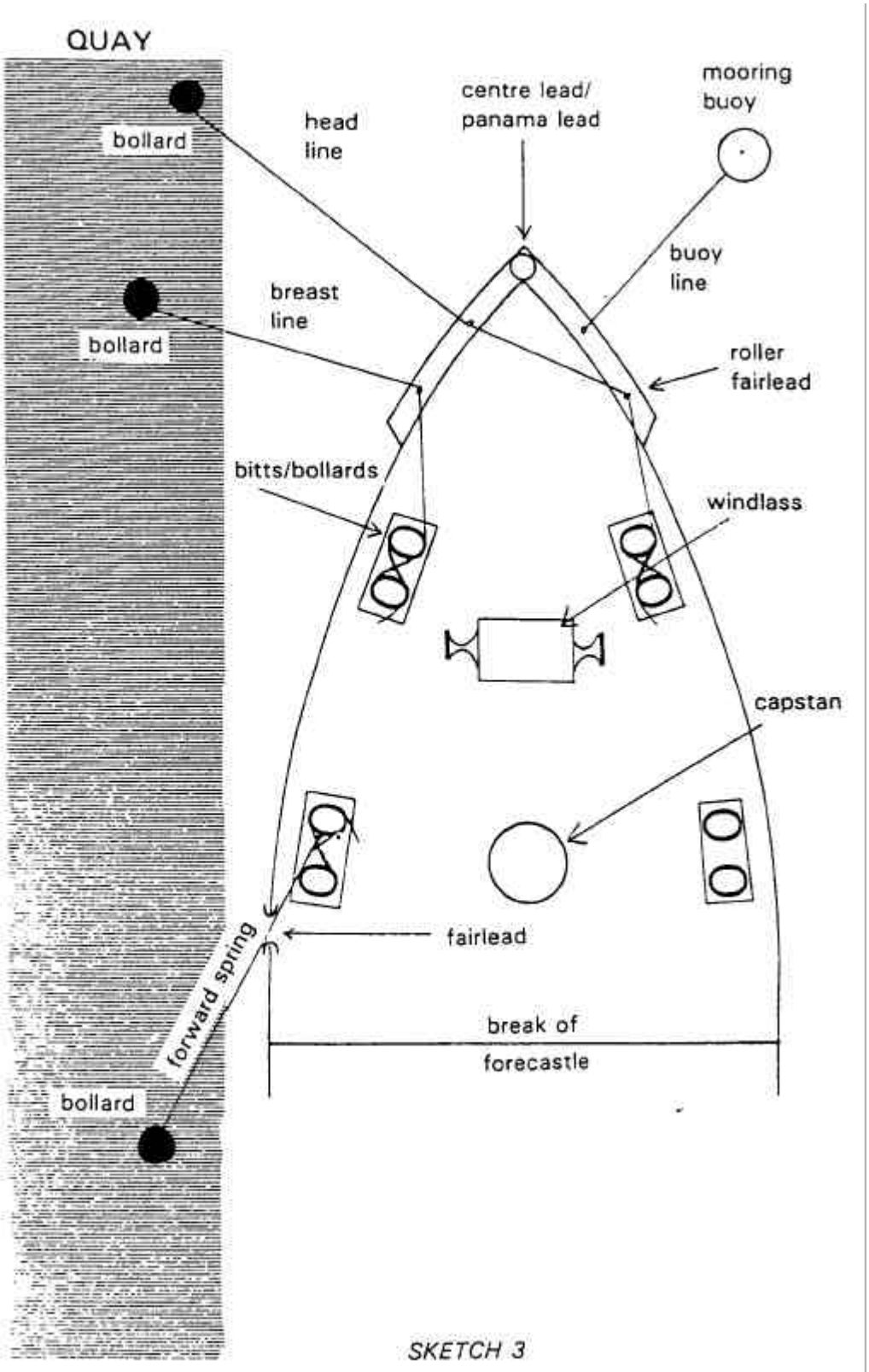
Fairway	Navigable part of a waterway
Fairway speed	Mandatory speed in a fairway
ITZ	Inshore Traffic Zone (of a TSS): A routing measure comprising a designated area between the landward boundary of a TSS and the adjacent coast
Manoeuvring speed	A vessel's reduced rate of speed in restricted waters such as fairways or harbours
Receiving point	A mark or place at which a vessel comes under obligatory entry, transit, or escort procedure
Reference line	A fictive line displayed on the radar screens in VTS Centres and/or electronic sea-charts separating the fairway for inbound and outbound vessels so that they can safely pass each other
Reporting point	A mark or position at which a vessel is required to report to the local VTS-Station to establish its position
Separation zone / line	A zone or line separating the traffic lanes in which vessels are proceeding in opposite or nearly opposite directions; or separating a traffic lane from the adjacent sea area; or separating traffic lanes designated for particular classes of vessels proceeding in the same direction
Traffic clearance	VTS authorization for a vessel to proceed under conditions specified
Traffic lane	An area within defined limits in which one-way traffic is established
TSS	Traffic Separation Scheme: A routing measure aimed at the separation of opposing streams of traffic by appropriate means and by the establishment of traffic lanes
VTS	Vessel Traffic Services: Services, designed to improve safety and efficiency of vessel traffic and to protect the environment
VTS-area	Area controlled by a VTS-Centre or VTS-Station


head line
bow/stem
ahead
tug
towing line
port bow
starboard bow
forward breast line
forecastle
forward spring
forward
length overall (LOA)
PORT
STARBOARD
centre line
midships
abeam
abeam
bridge
port quarter
starboard quarter
aft
aft spring
aft breast line
astern
stern
stern line
breadth

SKETCH 1



SKETCH 2


QUAY
bollard
bollard
bollard
head line
centre lead/ panama lead
mooring buoy
buoy line
breast line
roller fairlead
bitts/bollards
windlass
capstan
fairlead
forward spring
break of forecastle

SKETCH 3

STANDARD MARINE COMMUNICATION PHRASES PART A

PART A covers Phrases applicable in external communications from ship to shore, shore to ship and ship to ship as required by STCW 1978, as revised, Table A-II/1, as well as Phrasesapplicable on board vessels in conversations between Pilots and bridge teams as required by Regulation 14(4) of Chapter V of SOLAS 1974, as revised.

AI EXTERNAL COMMUNICATION PHRASES

Attention: The use of Standard Phrases in vessels' external communication does not in any way exempt from applying the radiotelephone procedures as set out in the ITU - Radio Regulations.

AI/1 Distress traffic

The distress traffic controlling station/other stations may impose radio silence on any interfering stations by using the term:
"Seelonce Mayday / Distress"
unless the latter have messages about the distress.

AI/1.1 Distress communications

Note: A distress traffic has always to commence with stating the position of the vessel in distress as specified in "GENERAL 11 Positions /13 Bearings" if it is not included in the DSC distress alert.

.1 **Fire, explosion**

.1 I am / MV ... on fire (- after explosion).
.2 Where is the fire?
.2.1 Fire is
~ on deck.
~ in engine-room.
~ in hold(s).
~ in superstructure / accommodation / ... .
.3 Are dangerous goods on fire?
.3.1 Yes, dangerous goods are on fire.
.3.2 No, dangerous goods are not on fire.
.4 Is there danger of explosion?
.4.1 Yes, danger of explosion.
.4.2 No danger of explosion.
.5 I am / MV ... not under command.
.6 Is the fire under control?
.6.1 Yes, fire is under control.
.6.2 No, fire is not under control.
.7 What kind of assistance is required?
.7.1 I do not / MV ... does not require assistance.
.7.2 I require / MV ... requires
~ fire fighting assistance.
~ breathing apparatus - smoke is toxic.
~ foam extinguishers / CO_2 extinguishers.
~ fire pumps.
~ medical assistance / ... .
.8 Report injured persons.
.8.1 No persons injured.
.8.2 Number of injured persons / casualties: ... .

.2 **Flooding**

.1 I am/ MV ... is flooding below water line.
.2 I / MV ... cannot control flooding.
.3 What kind of assistance is required?
.3.1 I require / MV ... requires pumps / divers, ...
.3.2 I will send pumps / divers / ... .
.3.3 I cannot send pumps / divers ... .
.4 I have / MV ... has dangerous list to port side / starboard.
.5 I am / MV ... in critical condition.
.6 Flooding is under control.
.7 I / MV ... can proceed without assistance.
.8 I require / MV ... requires escort / tug assistance /... .

.3 **Collision**

.1 I have / MV ... has collided
~ with MV... .
~ with unknown vessel / object / ... .
~ with ...*(name)* light vessel.
~ with seamark ... *(charted name)*.
~ with iceberg/ ... .
.2 Report damage.
.2.1 I have / MV .. has damage above / below water line.
.2.2 I am / MV ... not under command.
.3 I / MV cannot repair damage.
.4 I / MV ... can only proceed at slow speed.
.5 What kind of assistance is required?
.5.1 I require / MV ... requires / escort / tug assistance /... .

.4 **Grounding**

.1 I am / MV ... aground.
.2 I require / MV ... requires tug assistance / pumps / ... .
.3 What part of your vessel is aground?
.3.1 Aground forward / amidships /aft / full length.
.4 Warning. Uncharted rocks in position ... .
.5 Risk of grounding at low water.
.6 I / MV ... will jettison cargo to refloat.
.6.1 Warning! Do not jettison IMO-Class cargo!
.7 When do you / does MV ... expect to refloat?
.7.1 I expect / MV ... expects to refloat
~ at ... UTC.
~ when tide rises.
~ when weather improves.
~ when draft decreases.
~ with tug assistance / ... .
.8 Can you / can MV ... beach?
.8.1 I / MV ... can / will beach in position ... .
.8.2 I / MV ... cannot beach.

.5 **List - danger of capsizing**

.1 I have / MV ... has dangerous list to port / starboard.

.2 I / MV ... will
~ transfer cargo / bunkers to stop listing.
~ jettison cargo to stop listing.
.3 I am / MV ... in danger of capsizing (- list increasing).

.6 **Sinking**

.1 I am / MV ... sinking after collision / grounding / flooding / explosion / ...
.2 I require / MV ... requires assistance.
.3 I am / MV ... proceeding to your assistance.
.4 ETA at distress position within ... hours / at ... UTC.

.7 **Disabled and adrift**

.1 I am / MV ...
~ not under command.
~ adrift.
~ drifting at ... knots to ... *(cardinal points)*.
.2 I require / MV ... requires tug assistance.

.8 **Armed attack / piracy**

.1 I am / MV ... under attack by pirates.
.1.1 I / MV ... was under attack by pirates.
.2 I require / MV ... requires assistance.
.3 What kind of assistance is required?
.3.1 I require / MV ... requires
~ medical assistance.
~ navigational assistance.
~ military assistance.
~ tug assistance.
~ escort / ... .
.4 Report damage.
.4.1 I have / MV .. has
~ no damage.
~ damage to navigational equipment / ... .
.4.2 I am / MV ... not under command.
.5 Can you / can MV ... proceed?
.5.1 Yes, I / MV ... can proceed.
.5.2 No, I / MV ... cannot proceed.

.9 **Undesignated distress**

.1 I have / MV ... has problems with cargo / engine(s) / navigation / ... .
.2 I require / MV ... requires ... .

.10 **Abandoning vessel**

.1 I / crew of MV ... must abandon vessel ... after explosion / collision / grounding / flooding / piracy / armed attack / ... .

.11 **Person overboard**

. 1 I have / MV ... has lost person overboard in position ... .

. 2 Assist with search in vicinity of position ... .
. 3 All vessels in vicinity of position ... keep sharp lookout and report to ... .
. 4 I am / MV.. is proceeding for assistance - ETA at ... UTC / within ... hours.
. 5 Search in vicinity of position ... .
. 5.1 I am / MV ... is searching in vicinity of position ... .
. 6 Aircraft ETA at ... UTC / within ... hours to assist in search.
. 7 Can you continue search?
. 7.1 Yes, I can continue search.
. 7.2 No, I cannot continue search.
. 8 Stop search.
. 8.1 Return to ... .
. 8.2 Proceed with your voyage.
.10 What is the result of search?
.10.1 The result of search is negative.
.11 I / MV ... located / picked up person(s) in position ... .
.12 Person picked up is crewmember / passenger of MV ... .
.13 What is condition of person(s)?
.13.1 Condition of person(s) bad / good.
.13.2 Person(s) dead.

AI/1.2 Search and Rescue communication

.1 **SAR communications** (specifying or supplementary to 1.1)

. 1 I require / MV ... requires assistance.
. 2 I am / MV ... proceeding to your assistance.
.3 What is your MMSI number?
.3.1 My MMSI number is …. .
What is your position?
..4.1 My position ... .
. 5 What is your present course and speed?
. 4 5.1 My present course ... degrees, my speed ... knots.
. 6 Report number of persons on board?
. 6.1 Number of persons on board: ... .
. 7 Report injured persons.
. 7.1 No person injured
. 7.2 Number of injured persons / casualties: ... .
. 8 Will you abandon vessel?
. 8.1 I will not abandon vessel.
. 8.2 I will abandon vessel at ... UTC.
.9 Is your EPIRB switched on?
.9.1 Yes, my EPIRB is switched on/inadvertently switched on.
.10 Did you transmit a DSC distress alert?
.10.1 Yes, I did transmit.
.10.2 No, I inadvertently transmitted.
. 11 How many lifeboats / liferafts (with how many persons) will you launch?
. 11.1 I will launch ... lifeboats / liferafts (with ... persons).
. 12 How many persons will stay on board?
. 12.1 No person will stay on board.
. 12.2 ... persons will stay on board.
. 13 What is the weather situation in your position?
. 13.1 Wind ...*(cardinal points)* force Beaufort ... .

. 13.2 Visibility good/moderate/poor.
. 13.3 Smooth/moderate/rough/high Sea / slight/moderate/heavy swell …*(cardinal points)*.
. 13.4 Current ... knots, to …*(cardinal points)*.
. 14 Are there dangers to navigation?
. 14.1 No dangers to navigation.
. 14.2 Warning! Uncharted rocks / ice / abnormally low tides. mines / ... .

.2 **Acknowledgement and / or relay of SAR - messages**

. 1 Received MAYDAY from MV ... at UTC on VHF Channel.../ frequency ....
. 2 Vessel in position ...
~ on fire
~ had explosion.
~ flooded.
~ in collision (with ..).
~ listing / in danger of capsizing.
~ sinking.
~ disabled and adrift.
~ abandoned / ... .
. 3 Vessel requires assistance.
. 4 Received your MAYDAY.
. 4.1 My position ... .
. 4.2 I / MV ... will proceed to your assistance.
. 4.3 ETA at distress position within ... hours / at ... UTC.

.3 **Performing / co-ordinating SAR - operations**

The questions are normally asked and advice is given by the On-scene Co-ordinator (OSC). For further information see IAMSAR Manual, London/Montreal,1998.

. 1 I will act as On-scene Co-ordinator.
. 1.1 I will show following signals / lights: ... .
. 2 Can you proceed to distress position?
. 2.1 Yes, I can proceed to distress position.
. 2.2 No, I cannot proceed to distress position.
. 3 What is your ETA at distress position?
. 3.1 My ETA at distress position within ... hours / at ... UTC.
. 4 MAYDAY position is not correct.
. 4.1 Correct MAYDAY position is ... .
. 5 Vessels are advised to proceed to position ... to start rescue.
. 6 Carry out search pattern ... starting at ... UTC.
. 7 Initial course ... degrees, search speed ... knots.
. 8 Carry out radar search.
. 9 MV ... allocated track number ... .
.10 MV / MVs ... adjust interval between vessels to ...kilometres / nautical miles.
.11 Adjust track spacing to ...kilometres / nautical miles.
.12 Search speed now ... knots.
.13 Alter course
~ to ... degrees (- at ... UTC).
~ for next leg of track now / at ... UTC.
.14 We resume search in position ... .
.15 Crew has abandoned vessel / MV ... .
.16 Keep sharp lookout for lifeboats / liferafts / persons in water / ... .

.4 **Finishing with SAR - operations**

.1 What is the result of search?
.1.1 The result of search is negative.
.2 Sighted
~ vessel in position ... .
~ lifeboats / life rafts in position ... .
~ persons in water / ... in position ... .
.3 Continue search in position ... .
.4 Can you pick up survivors?
.4.1 Yes, I can pick up survivors.
.4.2 No, I cannot pick up survivors.
.5 MV ... / I will proceed to pick up survivors.
.5.1 Stand by lifeboats / liferafts.
.6 Picked up
~ ... survivors in position ... .
~ ... lifeboats / liferafts (with ... persons / casualties) in position ... .
~ ... persons / casualties in lifejackets in position ... .
~ ... in position ... .
.7 Survivors in bad / good condition.
.8 Do you require medical assistance?
.8.1 Yes, I require medical assistance.
.8.2 No, I do not require medical assistance.
.9 Try to obtain information from survivors.
.10 There are
~ still ... lifeboats / liferafts with survivors.
~ no more lifeboats / liferafts.
.11 Total number of persons on board was ... .
.12 All persons / ... persons rescued.
.13 You / MV ... may stop search and proceed with voyage.
.14 There is no hope to rescue more persons.
.15 We finish with SAR - operations.

AI/13 Requesting medical assistance

. 1 I require / MV ... requires medical assistance.
. 2 What kind of assistance is required?
. 2.1 I require / MV ... requires
~ boat for hospital transfer.
~ radio medical advice.
~ helicopter with doctor (to pick up person(s)).
. 3 I / MV ... will
~ send boat.
~ send helicopter with doctor
~ send helicopter to pick up person(s).
~ arrange for radio medical advice on VHF Channel ... / frequency ... .
. 4 Boat / helicopter ETA at ... UTC / within ... hours.
. 5 Do you have doctor on board?
. 5.1 Yes, I have doctor on board.
. 5.2 No, I have no doctor on board.

. 6 Can you make rendezvous in position ... ?
. 6.1 Yes, I can make rendezvous in position at ... UTC / within ... hours.
. 6.2 No, I cannot make rendezvous.
. 7 I / MV ... will send boat / helicopter to transfer doctor.
. 8 Transfer person(s) to my vessel / to MV ... by boat / helicopter.
. 9 Transfer of person(s) not possible.

AI/2 Urgency traffic

Safety of a vessel (other than distress).
Note: An urgency traffic has always to commence with stating the position of the calling vessel if it is not included in the DSC alert.

.1 **Technical failure**

. 1 I am / MV ... not under command.
. 2 What problems do you have / does MV ... have?
. 2.1 I have / MV ... has problems with engine(s) / steering gear / propeller / ... .
. 3 I am / MV ...is manoeuvring with difficulty.
. 4 Keep clear of me / MV ... .
. 5 Navigate with caution.
. 6 I require / MV ... requires tug assistance / escort / ... .
. 7 I try / MV ... tries to proceed without assistance.
. 8 Stand by on VHF Channel ... / frequency ... .
.8.1 Standing by on VHF Channel ... / frequency ... .

.2 **Cargo**

. 1 I have / MV has ... lost dangerous goods of IMO-Class ... in position ... .
. 2 Containers / barrels / drums / bags / ... with dangerous goods of IMO-Class ... adrift near position ... .
. 3 I am / MV ... is spilling
~ dangerous goods of IMO-Class ... in position ...
~ crude oil / ... in position ... .
. 4 I require / MV… requires oil clearance assistance - danger of pollution.
. 5 I am / MV ... is dangerous source of radiation.

.3 **Ice damage**

. 1 I have / MV ... has damage above / below waterline.
. 2 What kind of assistance is required?
. 2.1 I require / MV ... requires
~ tug assistance.
~ ice-breaker assistance / escort / ... .
. 3 I have / MV ... has stability problems - heavy icing.
. 4 Can you proceed without assistance?
. 4.1 Yes, I can proceed without assistance.
. 4.2 No, I cannot proceed without assistance.
. 5 Stand by on VHF Channel ... / frequency ... .
. 5.1 Standing by on VHF Channel ... / frequency ... .

AI/3 Safety Communications

AI/3.1 Meteorological and hydrological conditions

.1 **Winds, storms, tropical storms, sea state**

. 1 What is wind direction and force in your position / in position ... ?
. 1.1 Wind direction ...*(cardinal points)*, force Beaufort ... in my position / in position ... .
. 2 What wind is expected in my position / in position ... ?
. 2.1 The wind in your position / in position ... is expected
~ from direction... *(cardinal points)*, force Beaufort ... .
~ to increase / decrease.
~ variable.
. 3 What is the latest gale / storm warning?
. 3.1 The latest gale / storm warning is as follows:
Gale / storm warning. Winds at ... UTC in area ... *(met.area)* from direction ...*(cardinal points)* and force Beaufort ... backing/veering to ... *(cardinal points)*.
. 4 What is the latest tropical storm warning?
. 4.1 The latest tropical storm warning is as follows:
Tropical storm warning at ... UTC. Hurricane... *(name)* / tropical cyclone /tornado/ willy-willy / typhoon ... *(name)* with central pressure of ... millibars /hPascals located in position ... Present movement... *(cardinal points)* at ... knots. Winds of ... knots within radius of ... miles of centre. Seas smooth/moderate/rough/high.
Further information on VHF Channel ... / frequency ... .
. 5 What is the atmospheric pressure in your position / in position ... ?
. 5.1 The atmospheric pressure in your position / in position ... is ... millibars/hPascals.
. 6 What is the barometric change in your position / in position ... ?
. 6.1 The barometric change in your position / in position ... is ... millibars/hPascals per hour / within the last ... hours.
. 6.2 The barometer is steady / dropping (rapidly) / rising (rapidly).
. 7 What maximum winds are expected in the storm area?
. 7.1 Maximum winds of ... knots are expected
~ in the storm area.
~ within a radius of ... kilometres / miles of the centre.
~ in the safe / dangerous semicircle.
.8 What is sea state in your position / in position ... ?
.8.1 The smooth/moderate/rough/high sea/ slight/moderate/heavy swell in my position / in position ... is ... metres from... *(cardinal points)*.

.9 Is the sea state expected to change (- within the next hours)?
.9.1 No, the sea state is not expected to change (- within the next hours).
.9.2 Yes, a sea / swell of ... metres from ...*(cardinal points)* is expected (- within the next hours).
.10 A tsunami / an abnormal wave is expected by ... UTC.

.2 **Restricted visibility**

. 1 What is visibility in your position / in position ... ?
. 1.1 Visibility in my position / in position is ... metres / nautical miles
. 1.2 Visibility is restricted by mist / fog / snow / dust / rain.
. 1.3 Visibility is increasing / decreasing / variable.
. 2 Is visibility expected to change in my position / in position ... (within the next hours)?
. 2.1 No, visibility is not expected to change in your position / in position...

(- within the next hours).

. 2.2 Yes, visibility is expected to increase / decrease to ... metres / nautical miles in your position / in position ... (within the next hours).

. 2.3 Visibility is expected to be variable between ... metres / nautical miles in your position / in position ... (within the next hours).

.3 **Ice**

. 1 What is the latest ice information?

. 1.1 Ice warning. Ice / iceberg(s) located in position ... / reported in area around ...

. 1.2 No ice located in position ... / reported in area around ... .

. 2 What ice situation is expected in my position / area around ... ?

. 2.1 Ice situation is

~ not expected to change in your position / area around ... .

~ expected to improve / deteriorate in your position / area around ... .

. 2.2 Thickness of ice is expected to increase / decrease in your position / area around ... .

. 3 Navigation is dangerous in area around ... due to floating ice / pack ice / iceberg(s).

. 4 Navigation in area around ... is only possible

~ for high-powered vessels of strong construction .

~ with ice-breaker assistance.

. 5 Area around ... temporarily closed for navigation.

. 6 Danger of icing in area around ... .

.4 **Abnormal tides**

. 1 The present tide ... is metres above / below datum in position ... .

. 2 The tide ... is metres above/below prediction.

. 3 The tide is rising / falling.

. 4 Wait until high / low water.

. 5 Abnormally high / low tides are expected in position ... at about ... UTC / within ... hours.

. 6 Is the depth of water sufficient in position ... ?

. 6.1 Yes, the depth of water is sufficient in position ... .

. 6.2 No, the depth of water is not sufficient in position ... .

. 6.3 The depth of water is ... metres in position ... .

. 7 My draft ... is metres - can I enter / pass ... *(charted name of place)*?

. 7.1 Yes, you can enter / pass *(charted name of place)*.

. 7.2 No, you cannot enter / pass *(charted name of place)* - wait until ... UTC.

. 8 The charted depth of water is increased / decreased by ... metres due to sea state / winds.

AI/3.2 Navigational warnings involving

.1 **Land- or seamarks**

Defects

.1 ...*(charted name of light / buoy)* in position ...

~ unlit / unreliable / damaged / destroyed / off station / missing.

Alterations

.2 ... *(charted name of lightbuoy / buoy)* in position ...

~ (temporarily) changed to ...*(full characteristics)*.

~ (temporarily) removed.
~ (temporarily) discontinued.

New and moved

.3 *...(charted name of light / buoy) ...(full characteristics)*
~ established in position ... .
~ re-established in position ... .
~ moved ... kilometres / nautical miles in ... *(direction)* to position ... .

.4 (Note: Only for major fog signal stations.)
Fog signal ...*(charted name of light / buoy)* in position ... inoperative.

.2 **Drifting objects**

.1 Superbuoy / mine / unlit derelict vessel / ... *(number)* container(s) adrift in vicinity ...*(position)* at ...*(date and time if known)*.

.3 **Electronic navigational aids**

.1 GPS Satellite ...*(number)* unusable from ... *(date and time)* to ...*(date and time)*. Cancel one hour after time of restoration.

.2 LORAN station ...*(name or number of master / secondary)* off air from ...*(date and time)* to ... *(date and time)*. Cancel one hour after time of restoration.

3 RACON ... *(name of station)* in position ... off air from ...*(date and time)* to... *(date and time)*. Cancel one hour after time of restoration.

.4 **Seabottom characteristics, wrecks**
Use REPORTED when position is unconfirmed, and use LOCATED when position has been confirmed by survey or other means

.1 Uncharted reef / rock / shoal / dangerous wreck / obstruction reported / located in position ... .

.2 Dangerous wreck in position... marked by ... *(type)*buoy ...*(distance in kilometres/nautical miles) ...(direction)*.

.5 **Miscellaneous**

.5.1 **Cable, pipeline and seismic / hydrographic operations**

.1 Cable / pipeline operations by ... *(vessel)* in vicinity / along line joining ... *(positions)* from ...*(date and time)*to ...*(date and time)*. Wide berth requested *(if requested*). Contact via VHF Channel ... *(if requested).*

.2 Seismic survey / hydrographic operations by ...*(vessel)* from ...*(date and time)* to... *(date and time)* in ...*(position)*. Wide berth requested*. (if requested*). Contact via VHF Channel ... *(if requested).*

.3 Survey vessel ...*(name)* towing ...*(length)* seismic cable along line joining / in area bounded by / in vicinity ...*(position)* from ...*(date and time)* to ...*(date and time)*. Wide berth requested *(if requested).* Contact via VHF Channel ... *(if requested).*

.4 Hazardous operations by ...*(vessel)* in area bounded by / in vicinity ... *(position)* from ... *(date and time)* to ...*(date and time)*. Wide berth requested *(if requested).* Contact via VHF Channel ... *(if requested).*

.5 Current meters / hydrographic instruments moored in ...*(position)*. Wide berth requested *(if requested).*

.5.2 **Diving, towing and dredging operations**

.1 Diving/dredging operations by vessel ... *(name)* from ...*(date and time)* to ...*(date and time)*
in position ... . Wide berth requested *(if requested)*.
.2 Difficult tow from ...*(port of departure)*on ... *(date)* to ...*(destination)*on ...*(date)*.
Wide berth requested.

.5.3 **Tanker transhipment**

.1 Transhipment of ...*(kind of cargo)* in position... . Wide berth requested.
.2 I am / MT ... spilling oil / chemicals /... in position....Wide berth requested.
.3 I am / LNG-tanker ... leaking gas in position... - do not pass to windward.
.4 Oil clearance operations near MT ... in position ... . Wide berth requested.

.5.4 **Off-shore installations, rig moves**

.1 Platform ...*(name/number if available)* reported / established in position... at ... *(date and time)*.Wide berth requested *(if requested)*.
.2 Platform ...*(name/number if available)* removed from ...*(position)* on ... *(date)*.
.3 Pipeline / platform ...*(name/number if available)* in position ... spilling oil / leaking gas. Wide berth requested.
.4 Derelict platform ...*(name/number if available)* being removed from ...*(position)* at ... *(date and time)*.Wide berth requested.

.5.5 **Defective locks or bridges**

.1 Lock ...*(name)* defective.
.1.1 For entering ...*(charted name of place)* use lock ...*(name)*.
.2 Lock / bridge ... *(name)* defective.
.2.1 Avoid this area - no possibility for vessels to turn.

.5.6 **Military operations**

.1 Gunnery / rocket firing / missile / torpedo / underwater ordnance exercises in area bounded by ... *(positions)* from ... *(date and time)* to... *(date and time)*. Wide berth requested *(if requested)*.
.2 Mine clearing operations from ...*(date time)* to ...*(date and time)* in area bounded by ...*(positions)*.Wide berth requested. Contact via VHF channel ...*(number) (if requested)*.

.5.7 **Fishery**

.1 Small fishing boats in area around ... - navigate with caution.
.2 Is fishing gear ahead of me?
.2.1 No fishing gear ahead of you.
.2.2 Yes, fishing gear with buoys / without buoys in position .../ area around ... - navigate with caution.
.3 Fishing gear has fouled my propeller(s).
.4 You have caught my fishing gear.
.5 Advise you to recover your fishing gear.
.6 Fishing in area ... prohibited.

AI/3.3 Environmental protection communications

.1 Located oil spill in position ... extending ... *(length and width in metres)* to ... *(cardinal points)*.
.2 Located oil spill
~ in your wake.
~ in the wake of MV ... .
.3 I have / MV ... has accidental spillage of oil / ... .
.4 Can you / MV ... stop spillage?
.4.1 Yes, I / MV ... can stop spillage.
.4.2 No, I / MV ... cannot stop spillage.
.5 What kind of assistance is required?
.5.1 I require / MV ... requires
- oil clearance assistance.
- floating booms / oil dispersants / ... .
.5 Stay in vicinity of pollution and co-operate with oil clearance team.
.6 ... *(number)* barrels / drums / containers with IMDG - Code marks reported adrift near position..... .
.7 Located a vessel dumping chemicals / waste / ... in position ... .
.7.1 Located a vessel incinerating chemicals / waste / ... in position ... .
.8 Can you identify the polluter?
.8.1 Yes, I can identify the polluter - polluter is MV ... .
.8.2 No, I cannot identify the polluter.
.9 What is course and speed of the polluter?
.9.1 Course of the polluter ... degrees, speed ... knots.
.9.2 The polluter left the scene.

AI/4 Pilotage

AI/4.1 Pilot request

See AI/6 - .4.3 “Pilot request”

AI/4.2 Embarking / disembarking pilot

.1 Stand by pilot ladder.
.2 Rig the pilot ladder on port side / starboard side ... metres above water.
.3 The pilot ladder is rigged on port side / starboard side.
.4 You must rig another pilot ladder
.5 The pilot ladder is unsafe.
.6 What is wrong with the pilot ladder?
.7.1 The pilot ladder
~ has broken / loose steps.
~ has broken spreaders.
~ has spreaders too short.
~ is too far aft / forward.
.8 Move the pilot ladder
~ ... metres aft / forward.
~ clear of discharge.
.9 Rig the accommodation ladder in combination with the pilot ladder.
.10 Rig the pilot ladder alongside hoist.

.11 Put lights on at the pilot ladder.
.12 Man ropes are required / not required.
.13 Have a heaving line ready at the pilot ladder.
.14 Correct the list of the vessel.
.15 Make a lee on your port side / starboard side.
.16 Steer ... degrees to make a lee.
.17 Keep the sea on your port quarter / starboard quarter.
.18 Make a boarding speed of ... knots.
.19 Stop engine(s) until pilot boat is clear.
.20 Put helm hard to port / starboard.
.21 Alter course to … (cardinal points) - the pilot boat cannot clear the vessel.
.22 Put engine(s) ahead / astern.
.23 Embarkation is not possible.
.23.1 Boarding arrangements do not comply with SOLAS - Regulations.
.23.2 Vessel is not suited for the pilot ladder.

AI/4.3 Tug request

.1 Must I take tug(s)?
.1.1 Yes, you must take ... tug(s).
.1.2 No, you need not take tug(s).
.2 How many tugs must I take?
.2.1 You must take ... tug(s) according to Port Regulations.
.2.2 You must take ... tug(s) fore and ... tug(s) aft.
.3 I require ... tug(s).
.4 In what position will the tug(s) meet me?
.4.1 The tug(s) will meet you in position ... at ...UTC.
.4.2 Wait for the tug(s) in position ... .
.5 Must I use the towing lines of my vessel?
.5.1 Yes, you must use the towing lines.
.5.2 No, you must use the towing lines of the tug.

AI/5 Specials

AI/5.1 Helicopter operations
(H: = from helicopter V: = from vessel)

.1 V: I require a helicopter.
~ to pick up persons.
~ with doctor.
~ with liferaft / ... .
.1.1 MRCC: I will send a helicopter with ... .
.2 H: MV ... , I will drop ... .
.3 H: MV ... , are you ready for the helicopter?
.3.1 V: Yes, I am ready for the helicopter.
.3.2 V: No, I am not ready for the helicopter (yet).
.3.3 V: Ready for the helicopter in ... minutes.
.4 H: MV ... , helicopter is on the way to you.
.5 H: MV ... , what is your position.
.5.1 V: My position is ... .
.6 H: MV ... , what is your present course and speed.
.6.1 V: My present course is ... degrees, speed is ... knots.
.7 H: MV ... , make identification signals.

.8 V: I am making identification signals by smoke (buoy) / search light / flags / signalling lamp / ... .
.9 H: MV ... , you are identified.
.10 H: MV ... , what is the relative wind direction in degrees and knots.
.10.1 V: The relative wind direction is ... degrees and ... knots.
.11 H: MV ... , keep the wind on port / starboard bow.
.12 H: MV ... , keep the wind on port / starboard quarter.
.13 H: MV ... , indicate the landing / pick-up area.
.13.1 V: The landing / pick-up area is ... .
.14 H: MV ... , can I land on deck?
.14.1 V: Yes, you can land on deck.
.14.2 V: No, you cannot land on deck (yet).
.14.3 V: You can land on deck in ... minutes.
.15 H: MV ... , I will use hoist / rescue sling / rescue basket / rescue net / rescue litter / rescue seat / double lift.
.16 V: I am ready to receive you.
.17 H: MV ... , I am landing.
.18 H: MV ... , I am starting operation.
.19 H: MV ... , do not fix the hoist cable.
.20 H: MV ... , operation finished.
.21 H: MV ... , I am taking off.

AI/5.2 Ice - breaker operations

.1 **Ice - breaker request**

.1 I am / MV is ... fast in ice in position ... .
.2 I require / MV ... requires ice-breaker assistance to reach ... .
.3 Ice-breaker assistance
~ will arrive at ... UTC / within ... hours.
~ is not available until ... UTC.
~ is available only up to latitude... longitude....
~ is suspended until...*(date and time)*.
~ is suspended after sunset.
~ is suspended until favourable weather conditions.
~ will be resumed at ... UTC.

.2 **Ice - breaker assistance for convoy**

Ice-breaker commands applying to all the vessels in a convoy have to be immediately confirmed consecutively by each vessel in turn and executed according to the pattern given in
GENERAL 4.6. Ice-breaker commands applying to a single vessel are confirmed and executed only by that vessel, this applies also for close coupled towing. When being assisted by an ice-breaker it is important to maintain a continuous listening watch on the appropriate VHF Channel and to maintain a proper lookout for sound and visual signals.

.1 Ice breaker assistance for convoy will start now / at ... UTC.
.2 Your place in convoy is number ... .
.3 MV ... will follow you.
.4 You will follow MV ... .
.5 Go ahead and follow me.
.5.1 Do not follow me.
.6 Proceed along the ice channel.

.7 Increase / reduce your speed.
.8 Reverse your engines.
.9 Stop engines.
.10 Keep a distance of ... metres /cables between vessels.
.11 Increase / reduce the distance between vessels to ... metres / cables.
.12 Stand by for receiving towing line.
.12.1 Stand by for letting go towing line.
.13 Switch on the bow / stern search light
.14 Stop in present position.
.15 Ice-breaker ... will escort you.
.16 Ice-breaker assistance for convoy finished.
.16.1 Open water / light ice conditions ahead.
.17 Proceed by yourself (to area ...).

.3 **Ice - breaker assistance in close-coupled towing**

.1 Stand by for close coupled towing.
.2 Slack out your anchors under the hawse-pipes.
.3 Pass heaving lines through the hawse-pipes.
.4 Receive towing line on deck.
.5 Lash together the eyes of the towing line with manila lashing.
.6 Fasten towing line on your bitts.
.7 I start to draw your bow into the stern notch of the ice-breaker.
.8 Stand by for cutting the manila lashing if required.
.9 Keep yourself in the centre-plane of the ice-breaker.

AI/6 Vessel Traffic Service (VTS) Standard Phrases

Application of Message Markers

In order to especially facilitate shore-to-ship and ship-to-shore communication or when one of the Standard Marine Communication Phrases will not fit the meaning desired, one of the following eight message markers may be used to increase the probability of the purpose of the message being properly understood.

It is at the discretion of the shore personnel or the ship´s officer whether to use one of the message markers and if so which of them to apply depending on the user`s qualified assessment of the situation. If used the message marker is to be spoken preceding the message or the corresponding part of the message. The IMO VTS Guidelines recommend that in any message directed to a vessel it should be clear whether the message contains **information, advice, warning**, or **instruction** and IMO Standard Marine Communication Phrases should be used where practicable.

For further standardized VTS communications, also see other sections of PART AI. For VTS Standard Reporting Procedures see IMO Resolution A. 851 (20) on “General Principles for Ship Reporting Systems and Ship Reporting Requirements, including guidelines for reporting incidents involving dangerous goods, harmful substances and / or marine pollutants".

Note: All of the following phrases must come as the culmination (message content) of a radio message exchange between stations covered by the ITU Radio Regulations, and the relevant calling procedures have to be observed.

Message Markers

(i) INSTRUCTION

This indicates that the following message implies the intention of the sender to influence others by a Regulation.

Comment: This means that the sender, e.g. a VTS - Station or a naval vessel, must have the full authority to send such a message. The recipient has to follow this legally binding message unless s/he has contradictory safety reasons which then have to be reported to the sender.

Example: "INSTRUCTION. Do not cross the fairway."

(ii) ADVICE

This indicates that the following message implies the intention of the sender to influence others by a Recommendation.

Comment: The decision whether to follow the ADVICE still stays with the recipient. ADVICE does not necessarily have to be followed but should be considered very carefully.

Example: "ADVICE. (Advise you) stand by on VHF Channel six nine."

(iii) WARNING

This indicates that the following message implies the intention of the sender to inform others about danger.

Comment: This means that any recipient of a WARNING should pay immediate attention to the danger mentioned. Consequences of a WARNING will be up to the recipient.

Example: "WARNING. Obstruction in the fairway."

(iv) INFORMATION

This indicates that the following message is restricted to observed facts, situations, etc..

Comment: This marker is preferably used for navigational and traffic information, etc.. Consequences of INFORMATION will be up to the recipient.

Example: "INFORMATION. MV Noname will overtake to the West of you ."

(v) QUESTION

This indicates that the following message is of interrogative character.

Comment: The use of this marker removes any doubt on whether a question is being asked or statement being made, especially when interrogatives such as What, Where, Why, Who, How are additionally used at the beginning of the question. The recipient is expected to return an answer.

Example: "QUESTION.(What is) your present maximum draft?"

(vi) ANSWER

This indicates that the following message is the reply to a previous question.

Comment: Note that an answer should not contain another question.

Example: "ANSWER. My present maximum draft is zero seven metres."

(vii) REQUEST

This indicates that the following message is asking for action from others with respect to the vessel.

Comment: The use of this marker is to signal: I want something to be arranged or provided, e.g. ship´s stores requirements, tugs, permission, etc..

Note: REQUEST must not be used involving navigation, or to modify COLREGS.

Example: "REQUEST. I require two tugs."

(viii) INTENTION

This indicates that the following message informs others about immediate navigational action intended to be taken.

Comment: The use of this message marker is logically restricted to messages announcing navigational actions by the vessel sending this message.

Example: "INTENTION. I will reduce my speed."

AI/6.1 Phrases for acquiring and providing data for a traffic image

.1 **Acquiring and providing routine traffic data**

.1 What is the name of your vessel and call sign / identification?
.1.1 The name of my vessel is ... , call sign ... / identification ... .
.1.2 Spell the name of your vessel.
.2 What is your flag state?
.2.1 My flag state is ... .
.3 What is your position?
.3.1 My position is ... .
.4 What is your present course and speed?
.4.1 My present course is ... degrees, my speed is ... knots.
.5 From what direction are you approaching?
.5.1 I am approaching from ... .
.6 What is your port of destination / destination?
.6.1 My port of destination / destination is ... .
.7 What was your last port of call?
.7.1 My last port of call was ... .
.8 What is your ETA in position ... ?
.8.1 My ETA is ... UTC.
.9 What is your ETD from ... ?
.9.1 My ETD from ... is ... UTC.
.10 What is your draft forward / aft?
.10.1 My draft forward / aft is ... metres.
.11 What is your present maximum draft ?
.11.1 My present maximum draft is ... metres.
.12 What is your freeboard?
.12.1 My freeboard is ... metres.
.13 What is your air draft?
.13.1 My air draft is ... metres.
.14 Are you underway?
.14.1 Yes, I am underway.
.14.2 No, I am not underway.
.14.3 I am ready to get underway.
.15 What is your full speed / full manoeuvring speed?
.15.1 My full speed / full manoeuvring speed is ... knots.
.16 What is your cargo?
.16.1 My cargo is ... .
.17 Do you carry any dangerous goods?
.17.1 Yes, I carry the following dangerous goods: ... kilogrammes / tonnes IMO Class ... .
.17.2 No, I do not carry any dangerous goods.

.18 Do you have any deficiencies / restrictions?
.18.1 No, I have no deficiencies / restrictions.
.18.2 Yes, I have the following deficiencies / restrictions: ... .
.19 I am / MV ... is constrained by draft.
.20 The maximum permitted draft is ... metres.
.21 Do you have any list?
.21.1 Yes, I have a list to port / starboard of ... degrees.
.21.2 No, I have no list.
.22 Are you on even keel?
.22.1 Yes, I am on even keel.
.22.2 No, I am trimmed by the head / stern.

.2 **Acquiring and providing distress traffic data**
See AI/1.1 "Distress communications "

AI/6.2 Phrases for providing VTS services

.1 **Information service**
These phrases are normally transmitted from the shore.

.1.1 **Navigational warnings**

.1 Unknown object(s) in position ... .
.2 Ice / iceberg(s) in position ... / area around ... .
.3 Unlit derelict vessel adrift in vicinity ... at ... *(date and time).*
.4 Dangerous wreck / obstruction located in position ... marked by ... *(type)* buoy.
.5 Hazardous mine adrift in vicinity ... at ... *(date and time).*
.6 Uncharted reef / rock / shoal reported in position ... .
.7 Pipeline is leaking gas / oil in position ... - wide berth requested.
.8 Depth of water not sufficient in position ... .
.9 Navigation closed in area ... .

.1.2 **Navigational information**

.1 Oil spill in position ... .
.2 Current meters / hydrographic instruments moored in position ...- wide berth requested.
.3 Platform ...*(name / number)* reported / established in position ... - wide berth requested.
.4 ...*(charted name of light / buoy)* in position ...
~ unlit / unreliable / damaged / destroyed / off station / missing.
~ (temporarily) changed to ...*(full characteristics).*
~ (temporarily) removed.
~ (temporarily) discontinued.
.5 ...*(charted name of light / buoy) ...(full characteristics)*
~ established in position ... .
~ re-established in position ... .
~ moved ... kilometres / nautical miles in ... *(direction)* to position ... .
.6 (Note: Only for major fog signal stations.)
Fog signal ...*(charted name of light / buoy)* in position ... inoperative.

.1.3 **Traffic information**

.1 Gunnery / rocket firing / missile / torpedo / underwater ordnance exercises in area bounded by ...*(positions)* and ... from ... *(date and time)* to ... *(date and time)*.
Wide berth requested.

.2 Cable / pipeline operations by... *(vessel)* in vicinity ... / along a line joining ...*(position)* from ... *(date and time)* to... *(date and time*) - wide berth requested. Contact via VHF Channel ...

.3 Salvage operations in position ... from ... *(date and time)* to ... *(date and time)* - wide berth requested. Contact via VHF Channel ... .

.4 Seismic / hydrographic operations by ... (*vessel)*... from ... *(date and time)* to ...*(date and time)* in position ... - wide berth requested.
Contact via VHF Channel ... .

.5 Oil clearance operations near MT ... in position ... - wide berth requested.

.6 Transhipment of ...*(kind of cargo)* in position ... - wide berth requested.

.7 Difficult tow from ...*(port of departure)* to ...*(destination)* on ...*(date)* - wide berth requested.

.8 Vessel not under command in position ... / area ... .

.9 Hampered vessel in position ... area ... (course ... degrees, speed ... knots).

.10 Vessel in position ... on course ... and speed ... is not complying with traffic regulations.

.11 Vessel is crossing ... traffic lane on course ... and speed ... in position ... .

.12 Small fishing boats in area around ... - navigate with caution.

.13 Submarines operating in sea area around ... surface vessels are in attendance.

.1.4 **Route information**

.1 Route .../ Traffic Lane ... has been suspended / discontinued / diverted.

.1.5 **Hydrographic information**

.1 Tidal prediction for ... *(name of station(s))* / area ... :

.1.1 A tide of ... metres above / below datum is expected in position ... / area ... at about ... UTC.

.1.2 Abnormally high / low tides are expected in position ... / area ... at about ... UTC.

.2 The tide is rising -
~ it is ... hours before high water / after low water.
~ it is ... metres below high water / above low water.

.3 The tide is falling -
~ it is ... hours after high water / before low water.
~ it is ... metres below high water / above low water.

.4 The tide is slack.

.5 Present tide is ... metres above / below datum ... in position ... ..

.6 The tide is ... metres above / below prediction

.7 The tidal stream / current is ... knots in position ... .

.8 The tide is setting in direction ... degrees.

.9 The depth of water is / is not sufficient in position ... .

.12 Charted depth has increased / decreased by ... metres due to winds / sea state.

.1.6 **Electronic navigational aids information**

.1 GPS Satellite ...*(number)* unusable from ...*(date and time)* to ... *(date and time)*.
Cancel one hour after time of restoration.
.2 LORAN station ...*(name number of master / slave)*
.3 RACON ... *(name of station)* in position ... off air ... from ... *(date and time)*
to ... *(date and time)*.

.1.7 **Meteorological warnings**

.1 Gale warning / storm warning was issued at ... UTC starting at ... UTC .
.1.1 Gale warning / storm warning. Wind at ... UTC in area ... *(met. area)* from direction ... *(cardinal points)* and force Beaufort ... backing / veering to ... *(cardinal points)*.
.2 Tropical storm warning was issued at ... UTC starting at ... UTC.
.2.1 Tropical storm warning at ... UTC. Hurricane ... *(name)* / tropical cyclone / tornado / willy-willy / typhoon / ... with central pressure of ... millibars/hPascals located in position ... .

Present movement ... *(cardinal points)* at ... knots. Winds of ... knots within radius of ... nautical miles of centre. Seas over ... metres.
Further information on VHF Channel ... / frequency ... (at ... UTC).

.1.8 **Meteorological information**

.1 Position of tropical storm ... *(name)* ..., path ... *(cardinal points)*, speed of advance ... knots.
.2 Wind direction ...*(cardinal points)*, force Beaufort ... in position ... .
.3 Wind is backing / veering and increasing / decreasing.
.4 Wind is expected to increase / decrease in position ... to force Beaufort ... within the next... hours.
.5 Visibility in position ...
~ ... metres / nautical miles.
~ reduced by mist / fog / snow / dust / rain / ... .
~ expected to increase / decrease to ... metres / nautical miles within the next ... hours.
.6 Sea / swell in position ...
~ ... metres from ...*(cardinal points)*.
~ expected to increase / decrease within the next ... hours.
.7 Icing is expected / not expected in area ... .

.1.9 **Meteorological questions and answers**
See AI/3.1 “Meteorological and hydrological conditions”

.2 **Navigational assistance service**
Shore based pilotage by Navigational Assistance Service: also see AI/6.4 .3.18 to .3.21

.2.1 **Request and identification**

.1 Is shore based radar assistance available?
.1.1 Yes, shore based radar assistance is available.
.1.2 No, shore based radar assistance is not available.
.2 Shore based radar assistance is available from ... to ... UTC.
.3 Do you require navigational assistance to reach ... ?
.3.1 Yes, I require navigational assistance.

.3.2 No, I do not require navigational assistance
.4 What is your position?
.4.1 My position is bearing ... degrees ..., distance ... kilometres / nautical miles from ... .
.5 How was your position obtained?
.5.1 My position was obtained by GPS / RADAR / cross-bearing / astronomical observation / ...
.6 Repeat your position for identification.
.7 I have located you on my radar screen.
.7.1 Your position is bearing ... degrees, distance ... kilometres / nautical miles from ... .
.8 I cannot locate you on my radar screen.
.9 What is your present course and speed?
.9.1 My present course is ... degrees, my speed is ... knots.
.10 What is the course to reach you?
.10.1 The course to reach me is ... degrees.
.11 Is your radar in operation?
.11.1 Yes, my radar is in operation.
.11.2 No, my radar is not in operation.
.12 What range scale are you using?
.12.1 I am using ... miles range scale.
.12.2 Change to a larger / smaller range scale.
.13 You are leaving my radar screen.
.14 Change to radar ... *(name)* VHF Channel ... .
.15 I have lost radar contact.

.2.2 **Position**

.1 You are entering ... .
.2 Your position is .../ bearing ... degrees, distance ... kilometres / nautical miles from ... .
.4 You are passing ... .
You are
~ in the centre of the fairway.
~ on / not on the radar reference line (of the fairway).
~ on the ... *(cardinal points)* side of the fairway.
.5 You are approaching the ... *(cardinal points)* limit of the fairway.
.6 Your position is buoy number ... distance ... metres / cables to the ... *(cardinal points)* of the radar reference line
.7 Your position is distance ... metres / cables from the intersection of radar reference line ... and radar reference line ... and distance ... metres / cables to the ... *(cardinal points)* of radar reference line ... .
.8 MV ... has reported at reporting point ... .
.9 You are getting closer to the vessel … *(cardinal points)* of you.
.10 Vessel on opposite course is passing to the ... *(cardinal points)* of you.
.11 MV ... is metres / cables ... *(cardinal points)* of you
~ is ingoing / outgoing.
~ has stopped.
~ is at anchor.
~ is on a reciprocal course
~ will overtake to the ... *(cardinal points)* of you
.12 Vessel has anchored ... metres / cables ... *(cardinal points)* of you in position ... .
.13 Vessel ... *(cardinal points)* of you is obstructing your movements.
.14 You will meet crossing traffic in position ... .
.15 Vessel is entering / leaving the fairway at ... .
.16 Buoy ... distance ... metres / cables ... *(cardinal points).*

.17 Vessel ... *(cardinal points)* of you is
~ turning.
~ anchoring.
~ increasing / decreasing speed.
~ overtaking you.
~ not under command.

.2.3 **Course**

Note: The user of this phrase should be fully aware of the implications of words such as "track", "heading" and "course made good".

.1 Your track is
~ parallel with the reference line.
~ diverging from the reference line.
~ converging to the reference line.
.2 What is your present course / heading?
.2.1 My present course / heading is ... degrees
.3 You are steering a dangerous course.
.4 Course to make good is ... degrees.
.5 Vessel ... *(cardinal points)* of you is on same course ... degrees.
.5.1 Advise you
~ Keep your present course.
~ a new course of … degrees.
.6 Have you altered course?
.6.1 Yes, I have altered course - my new course is ... degrees.
.6.2 No, I have not altered course - my course is ... degrees.
.7 You are running into danger -
~ shallow water ... *(cardinal points)* of you.
~ submerged wreck ... *(cardinal points)* of you.
~ fog bank ... *(cardinal points)* of you.
~ risk of collision (with a vessel bearing ... degrees, distance ... kilometres / nautical miles).
~ bridge is defective / ... .

.3 **Traffic organization service**

.3.1 **Clearance, forward planning**

.1 Traffic clearance is required before entering ... .
.2 Do not enter the traffic lane / ... .
.3 Proceed to the emergency anchorage.
.4 Keep clear of .../ avoid ... .
.5 You have permission
~ to enter the traffic lane / route - traffic clearance granted.
~ to enter traffic lane / route in position ... at ... UTC.
.6 Do not pass the reporting point ... until ... UTC.
.7 Report at the next way point / way point ... / at ... UTC.
.8 You must arrive at way point ... at ... UTC - your berth is clear.
.9 Do not arrive in position ... before / after ... UTC.
.10 The tide is with you / against you.

.3.2 **Anchoring**

.1 You must anchor
~ at ... UTC.
~ until the pilot arrives.
~ in a different position.
~ clear of fairway.
.2 Do not anchor in position ... .
.3 Anchoring is prohibited.
.6 You must heave up anchor.
.7 You are at anchor in a wrong position.
.8 Have your crew on stand by for heaving up anchor when the pilot embarks.
.9 You have permission to anchor (at ... UTC)
~ in position ... .
~ until the pilot arrives.
~ until the tugs arrive.
~ until sufficient water.
.10 You are obstructing the fairway / other traffic.
.11 Are you dragging / dredging anchor?
.11.1 Yes, I am dragging / dredging anchor.
.11.2 No, I am not dragging / dredging anchor.
.12 Do not dredge anchor.

.3.3 **Arrival, berthing and departure**

.1 Your orders are to berth on ... .
.2 Your orders are changed to proceed to ... .
.3 Proceed to ... for orders.
.4 You have permission to enter / to proceed at ... UTC.
.5 Vessel is turning / manoeuvring in position ... .
.6 MV ...
~ will turn in position ... .
~ will leave ... at ... UTC.
~ is leaving ... .
~ has left ... .
~ entered fairway in position ... .
.7 Your berth is not clear (until ... UTC)
.7.1 Your berth will be clear at ... UTC.
.8 You will berth / dock at ... UTC .
.9 Berthing has been delayed by ... hours.
.10 Be ready to get underway.
.10.1 I am ready to get underway
.11 Get underway.
.12 Are you underway?
.12.1 Yes, I am underway.
.12.2 No, I am not underway.
.13 Move ahead / astern ... metres.
.14 Your vessel is in position - make fast.

.3.4 **Enforcement**

.1 According to my radar, your course does not comply with Rule 10 of COLREGS.
.2 Your actions will be reported to the Authorities.
.3 You are
~ not complying with traffic regulations.

~ not keeping to the correct traffic lane.

.4 Have all navigational instruments in operation before entering this area / area ... .

.5 Your navigation lights are not visible.

.6 Recover your fishing gear.

.6.1 You are fishing in the fairway.

.7 Fishing gear is to the ... *(cardinal points)* of you.

.8 Fishing in area ...is prohibited.

.9 You are approaching a prohibited fishing area.

.10 Fairway speed is... knots.

.3.5 **Avoiding dangerous situations, providing safe movements**

.1 It is dangerous

~ to anchor in your present position.

~ to remain in your present position.

~ to alter course to ... *(cardinal points)*.

.2 Large vessel is leaving the fairway- keep clear of the fairway approach.

.3 Nets with buoys / without buoys in this area - navigate with caution.

.4 Collision in position ... .

.5 MV ... is aground / on fire / ... in position ... .

.6 Stand by for assistance.

.7 Vessels must

~ keep clear of this area / area ... .

~ avoid this area / area ... .

~ navigate with caution.

.8 Keep clear of ... - search and rescue in progress.

.9 Your present course is too close

~ to ingoing / outgoing vessel.

~ to the vessel that you are overtaking.

~ to the ... *(cardinal points)* limit of the fairway.

.10 Your course is deviating from the radar reference line.

.11 You are running into danger

~ shallow water .... *(cardinal points)* of you.

~ submerged wreck ... *(cardinal points)* of you.

~ fog bank ... *(cardinal points)* of you.

~ risk of collision (with vessel bearing ... degrees, distance ... kilometres / nautical miles).

~ bridge is defective.

.12 You are proceeding at a dangerous speed.

.13 You must

~ proceed by the fairway / route ... .

~ keep to the ... *(cardinal points)* of the fairway line / radar reference line.

~ stay clear of the fairway.

.14 You must wait for MV ... to cross ahead of you.

.15 You must wait for MV ... to clear ... before

~ entering the fairway.

~ getting underway.

~ leaving the berth.

.16 Do not

~ overtake.

~ cross the fairway.

.17 Alter course to ...*(cardinal points)* of you.

.18 Pass ... *(cardinal points)* of

~ ingoing /outgoing / anchored / disabled vessel.
~ of ... mark / ... .

.19 Stop engines.

.20 MV ...
~ wishes to overtake … *(cardinal points)* of you.
~ agrees / does not agree to be overtaken.
.
~ is approaching an obscured area ... - approaching vessels acknowledge.

.3.6 **Canal and lock operations**

.1 You must
~ close up on the vessel ahead of you.
~ drop back from the vessel ahead of you.
~ wait at ... .
~ moor at ... .
~ wait for lock clearance at ... until ... UTC.

.2 Convoy ... must wait / moor at ... .

.3 You will
~ join convoy ... at ... UTC.
~ enter canal / lock at ... UTC.

.4 Transit will begin at ... UTC.

.5 Your place in convoy is number ... .

.6 Transit / convoy speed is ... knots.

.7 Convoys / vessels will pass in area ... .

AI/6.3 Handing over to another VTS

.1 ... VTS this is ... VTS: MV ... position is bearing... degrees, distance ... kilometres / nautical miles from ... . working frequency is VHF Channel ... . Your target. Please confirm.

.2 ... VTS this is ... VTS: MV ... position bearing is ... degrees, distance ... kilometres / nautical miles from ... . I confirm. My target.

.3 .... VTS this is ... VTS: MV ... position is bearing... degrees, distance ... kilometres / nautical miles from ... . I am unable to take over this target.

AI/6.4 Phrases for communication with emergency services and allied services

.1 **Emergency services** (SAR, fire fighting, pollution fighting)
See AI/1 “Distress Communication”

.2 **Tug services**
Also see AII/3.6 “Tug assistance”

.1 How many tugs do you require?

.1.1 I require ... tug(s).

.2 You must take
~ ... tug(s) according to port regulations.
~ ... tug(s) fore and ... tug(s) aft.

.3 Wait for the tug(s) in position ... .

.4 The tugs will meet you in position ... at ... UTC.

.6 Tug services have been suspended until ...*(date and time)* / resumed on...*(date and time)*.

.3 **Pilot request**

.1 Must I take a pilot?
.1.1 Yes, you must take a pilot - pilotage is compulsory.
.1.2 No, you need not take a pilot.
.2 Do you require a pilot?
.2.1 Yes, I require a pilot.
.2.2 No, I do not require a pilot - I am holder of Pilotage Exemption Certificate (No. ...).
.3 You are exempted from pilotage.
.4 Do you require a pilot at ...*(name)* Pilot Station?
.4.1 Yes, I require a pilot at ...*(name)* Pilot Station.
.4.2 No, I do not require a pilot at ...*(name)* Pilot Station - I require a pilot in position ...
.5 What is your ETA at ...*(name)* Pilot Station in local time?
.5.1 My ETA at...*(name)* Pilot Station is ... hours local time.
.6 What is local time?
.6.1 Local time is ... hours.
.7 What is your position?
.7.1 My position is ... .
.8 What is your distance from ...*(name)* Pilot Station?
.8.1 My distance from ...*(name)* Pilot Station is ... kilometres / nautical miles.
.9 Is the pilot boat on station?
.9.1 Yes, the pilot boat is on station.
.9.2 No, the pilot boat is not on station.
.9.3 The pilot boat will be on station at ... hours local time.
.10 In what position can I take the pilot?
.10.1 Take the pilot at ...*(Pilot Station)* / near ... at ... hours local time.
.11 When will the pilot embark?
.11.1 The pilot will embark at ... hours local time.
.12 The pilot boat is coming to you.
.13 Stop in present position and wait for the pilot.
.14 Keep the pilot boat … *(cardinal points)* of you.
.15 What is your freeboard?
.15.1 My freeboard is ... metres.
.16 Change to VHF Channel ... for pilot transfer.
.17 Stand by on VHF Channel ... until pilot transfer is completed.
.18 Pilotage at ...*(name)* Pilot Station has been suspended until ... *(date and local time)*.
.19 Pilotage at ...*(name)* Pilot Station has been resumed.
.20 The pilot cannot embark at ... *(name)* Pilot Station due to ... .
.21 Do you accept shore-based navigational assistance from VTS Centre?
.21.1 Yes, I accept shore-based navigational assistance.
.21.2 No, I do not accept shore-based navigational assistance.
.21.3 I will stay in position ... until ... .
.22 You have permission to proceed by yourself (or wait for the pilot at ... buoy).
.23 Follow the pilot boat inward where the pilot will embark.

.4 **Embarking / disembarking pilot**

See AI/4.2 “Embarking/disembarking pilot”

Appendix to AI - External Communication Phrases
Standard GMDSS Messages
For further details see: ITU MANUAL for use by the Maritime Mobile and Maritime Mobile-Satellite Services, Geneva.

1 Standard Distress Message

.1 Structure

Upon receipt of a DSC Distress Alert acknowledgement the vessel in distress should commence the distress traffic on one of the international distress traffic frequencies for telephony (VHF Channel 16 or 2182 kHz) as follows:

MAYDAY
THIS IS
- the 9-digit Maritime Mobile Service Identity code (MMSI) plus name / call sign or other identification of the vessel calling
- the position of the vessel
- the nature of distress
- the assistance required
- any other information which might facilitate rescue.

.2 Example

MAYDAY
- THIS IS TWO-ONE-ONE-TWO-THREE-NINE-SIX-EIGHT-ZERO MOTOR VESSEL "BIRTE" CALL SIGN DELTA ALPHA MIKE KILO
- POSITION SIX TWO DEGREES ONE ONE DECIMAL EIGHT MINUTES NORTH
- ZERO ZERO SEVEN DEGREES FOUR FOUR MINUTES EAST
- I AM ON FIRE AFTER EXPLOSION
- I REQUIRE FIRE FIGHTING ASSISTANCE
- SMOKE NOT TOXIC OVER

2 Standard Urgency Message

.1 Structure

After the transmission of a DSC Urgency Call switch the transmitter to VHF Channel 16 or frequency 2182 kHz (if not automatically controlled) and commence the urgency traffic as follows:

PAN-PAN (repeated three times)
ALL STATIONS (repeated three times)
THIS IS
- the 9-digit MMSI of the vessel plus name / call sign or other identification
- the position of the vessel
- the text of the urgency message.

.2 **Example**

PAN-PAN PAN-PAN PAN-PAN
ALL STATIONS ALL STATIONS ALL STATIONS
- THIS IS TWO-ONE-ONE-TWO-THREE-NINE-SIX-EIGHT-ZERO
MOTORVESSEL "BIRTE" CALL SIGN DELTA ALPHA MIKE KILO
- POSITION SIX TWO DEGREES ONE ONE DECIMAL EIGHT MINUTES NORTH
ZERO ZERO SEVEN DEGREES FOUR FOUR MINUTES EAST
- I HAVE PROBLEMS WITH ENGINES
- I REQUIRE TUG ASSISTANCE OVER

3 Standard Safety Message

.1 **Structure**

After the transmission of a DSC Safety Call switch the transmitter to VHF Channel 16 or frequency 2182 kHz (if not automatically controlled) and transmit the safety message as follows:

SECURITE (repeated three times)
ALL STATIONS (or all ships in a specific geographical area, or to a specific station)
(repeated three times)
THIS IS

- the 9-digit MMSI of the vessel plus name / call sign or other identification
- the text of the safety message.

.3 **Example**

SECURITE SECURITE SECURITE
ALL SHIPS ALL SHIPS ALL SHIPS IN AREA PETER REEF
- THIS IS TWO-ONE-ONE-TWO-THREE-NINE-SIX-EIGHT-ZERO
MOTORVESSEL "BIRTE" CALL SIGN DELTA ALPHA MIKE KILO
- DANGEROUS WRECK LOCATED IN POSITION TWO NAUTICAL MILES
SOUTH OF PETER REEF OVER

AII ON-BOARD COMMUNICATION PHRASES (A)

AII/1 Standard Wheel Orders

All wheel orders given should be repeated by the helmsman and the officer of the watch should ensure that they are carried out correctly and immediately. All wheel orders should be held until countermanded. The helmsman should report immediately if the vessel does not answer the wheel.

When there is concern that the helmsman is inattentive s/he should be questioned:

"What is your heading ?" And s/he should respond:
"My heading is ... degrees."

Order	Meaning
1. Midships	Rudder to be held in the fore and aft position.
2. Port / starboard five	5° of port / starboard rudder to be held.
3. Port / starboard ten	10°of port / starboard rudder to be held.
4. Port / starboard fifteen	15°of port / starboard rudder to be held.
5. Port / starboard twenty	20° of port / starboard rudder to be held.
6. Port / starboard twenty-five	25°of port / starboard rudder to be held.
7. Hard -a-port / starboard	Rudder to be held fully over to port / starboard.
8. Nothing to port/starboard	Avoid allowing the vessel's head to go to port/starboard
. 9.Meet her	Check the swing of the vessel´s head in a turn.
10. Steady	Reduce swing as rapidly as possible.
11. Ease to five / ten / fifteen / twenty	Reduce amount of rudder to 5°/10°/15°/20° and hold.
12. Steady as she goes	Steer a steady course on the compass heading indicated at the time of the order. The helmsman is to repeat the order and call out the compass heading on receiving the order. When the vessel is steady on that heading, the helmsman is to call out: "Steady on ..."
13. Keep the buoy/ mark/ beacon/ ... on port side / starboard side.	
14. Report if she does not answer the wheel.	
15. Finished with wheel, no more steering.	

When the officer of the watch requires a course to be steered by compass, the direction in which s/he wants the wheel turned should be stated followed by each numeral being said separately, including zero, for example:

Order	Course to be steered
Port, steer one eight two	182°
Starboard, steer zero eight two	082°
Port, steer three zero five	305°

On receipt of an order to steer, for example, 182^0, the helmsman should repeat it and bring the vessel round steadily to the course ordered. When the vessel is steady on the course ordered, the helmsman is to call out:

"Steady on one eight two".

The person giving the order should acknowledge the helmsman's reply.

If it is desired to steer on a selected mark the helmsman should be ordered to:

"Steer on ... buoy / ... mark / ... beacon".

The person giving the order should acknowledge the helmsman's reply.

AII/2 Standard Engine Orders

Any engine order given should be repeated by the person operating the bridge telegraph(s) and the officer of the watch should ensure the order is carried out correctly and immediately.

Order

1. (Port / starboard engines) Full ahead / astern
2. (Port / starboard engines) Half ahead / astern
3. (Port / starboard engines) Slow ahead / astern
4. (Port / starboard engines) Dead slow ahead / astern
5. Stop (port / starboard) engines
6. Emergency full ahead / astern
7. Stand by engine
   (Engine-room personnel fully ready to manoeuvre and bridge manned to relay engine orders.)
8. Finished with engines – no more manoeuvring.
   (Operation of engines no longer required.)

In vessels fitted with twin propellers, the word "both" should be added to all orders affecting both shafts, e.g. "Full ahead both", and "Slow astern both", except that the words "Stop all engines" should be used, when appropriate. When required to manoeuvre twin propellers independently, this should be indicated, i.e. "Full ahead starboard", "Half astern port", etc.

Where bow thrusters are used, the following orders are used:

9. Bow thruster full / half to port / starboard.
10. Stern thruster full / half to port / starboard.
11. Bow / stern thruster stop

AII/3 Pilot on the Bridge

AII/3.1 Propulsion system

. 1 Is the engine a diesel or a turbine?
. 1.1 The engine is a diesel / turbine.
. 2 Is the engine-room manned or is the engine on bridge control?
. 2.1 The engine-room is manned.
. 2.2 The engine is on bridge control.
. 3 How long does it take to change the engines from ahead to astern?
. 3.1 It takes ... seconds to change the engines (from ahead to astern).
. 4 How long does it take to start the engines from stopped?
. 4.1. It takes ... seconds to start the engines (from stopped).
. 5 Is extra power available in an emergency?
. 5.1 Yes, extra power is available.
. 5.2 No, extra power is not available.
. 6 Do you have a controllable or fixed pitch propeller?
. 6.1 We have a controllable pitch propeller.
. 6.2 We have a fixed pitch propeller.
. 7 Do you have a right-hand or left - hand propeller?

. 7.1 We have a right-hand / left-hand propeller.
. 8 Do you have a single propeller or twin propellers?
. 8.1 We have a single propeller / twin propellers.
. 9 Do you have a bow thrusteror stern thruster?
. 9.1 We have one /two/.. bow thruster(s) / stern thruster(s).
.10 What is the maximum manoeuvring power ahead / astern?
.10.1 The maximum manoeuvring power ahead / astern is ... kiloWatts.
.11 What are the maximum revolutions ahead / astern?
.11.1 The maximum revolutions ahead / astern are ... .
.12 Do the twin propellers turn inward or outward when going ahead.
.12.1 The twin propellers turn inward / outward (when going ahead).

AII/3.2 Manoeuvring

. 1 I require the pilot card / manoeuvring data.
. 2 What is the diameter of the turning circle?
. 2.1 The diameter of the turning circle is ... metres.
. 3 What is the advance and transfer distance in a crash-stop?
. 3.1 The advance distance is ... kilometres / nautical miles,
the transfer distance is ... degrees (in a crash-stop).
. 4 How long does it take from hard-a-port to hard-a-starboard?
. 4.1 It takes ... seconds (from hard-a-port to hard-a-starboard).
. 5 Is the turning effect of the propeller very strong?
. 5.1 Yes, the turning effect (of the propeller) is very strong.
. 5.2 No, the turning effect (of the propeller) is not very strong.
. 6 Where is the whistle control?
. 6.1 The whistle control is on the console / on ... .
. 7 What notice is required to reduce from full sea speed to manoeuvring speed?
. 7.1 ... minutes notice is required (to reduce from full sea speed
to manoeuvring speed).
. 8 Do you have an automatic pilot?
. 8.1 Yes, we have an automatic pilot.
. 8.2 No, we do not have an automatic pilot.
.9. Give ... short / prolonged blast(s) (on the whistle).
.1 .10 Stand by lookout.
.11 Maintain a speed of ... knots.
.12 What is the (manoeuvring) speed at full / half / slow / dead slow ahead?
.12.1 The manoeuvring speed at full / half / slow / dead slow ahead is ... knots.
.13 What is the full sea speed / fairway speed?
.13.1 The full sea speed / fairway speed is … knots.

AII/3.3 Radar

.1 Is the radar operational?
.1.1 Yes, the radar is operational.
.1.2 No, the radar is not operational.
.2 Where is the radar antenna?
.2.1 The radar antanna is on … .
.3 Does the radar have any blind sectors?
.3.1 Yes, the radar has blind sectors from … to … degrees and from … to … degrees.
.3.2 No, the radar does not have any blind sectors.
.4 Change the radar to
~ … miles range scale.

~ relative head-up / north-up / course-up.
~ true-motion north-up / course-up.

AII/ 3.4 Draft and air draft

.1 What is your present maximum draft?
.1.1 My present maximum draft is … metres.
.1.2 My draft forward / aft is … metres.
.2 What is your air draft?
. 2.1 My air draft is … metres.

AII/3.5 Anchoring

.1 **Going to anchor**

.1 Stand by port / starboard / both anchor(s) for letting go.
.2 Walk out the anchor(s)
.3 We are going to anchorage.
.4 We will let go port / starboard / both anchor(s).
.5 Put … shackles in the water / in the pipe / on deck.
.6 Walk back port / starboard / both anchor(s) one / one and a half shackle(s).
.7 We will let go port / starboard / both anchor(s) … shackle(s) and dredge it / them.
.8 Let go port / starboard / both anchor(s).
.9 Slack out the cable(s).
.9.1 Check the cable(s).
.9.2 Hold on the port / the starboard / both cable(s).
.10 How is the cable leading?
.10.1 The cable is leading
~ ahead / astern.
~ to port / to starboard.
~ round the bow.
~ up and down.
.11 How is the cable growing?
.11.1 The cable is slack / tight / coming tight.
.12 Is / are the anchor(s) holding.
.12.1 Yes, the anchor(s) is / are holding.
.12.2 No, the anchor(s) is / are not holding.
.13 Is she brought up?
.13.1 Yes, she is brought up in position … .
.13.2 No, she is not brought up (yet).
.14 Switch on the anchor light(s).
.15 Hoist the anchor ball.
.16 Check the anchor position by bearings / by … .
.16.1 The anchor position is bearing … degrees,
distance … kilometres / nautical miles to … .
.16.2 Check the anchor position every … minutes.

.2 **Leaving the anchorage**

.1 How much cable is out?
.1.1 … shackle(s) is / are out.
.2 Stand by for heaving up.
.3 Put the windlass in gear.

.3.1 The windlass is in gear.
.4 How is the cable leading?
.4.1 The cable is leading
~ ahead / astern.
~ to port / to starboard.
~ round the bow.
~ up and down.
.5 Heave up port / starboard / both cable(s).
.6 How much weight is on the cable?
.6.1 Much / too much weight is on the cable.
.6.2 No weight is on the cable.
.7 Stop heaving.
.8 How many shackles are left (to come in)?
.8.1 ... shackles are left (to come in).
.9 Attention! Turn in cable(s).
.10 The anchor(s) is / are aweigh..
.10.1 The cables are clear.
.11 The anchor(s) is / are clear of the water / home / foul / secured.

AII/3.6 Tug assistance

.1 We will take ... tug(s).
.2 The tug(s) will pull / push.
.3 We use the towing line(s) of your vessel.
.3.1 We use the towing line(s) of the tug(s).
.4 Stand by for making fast the tug(s).
.5 Use the centre lead / panama lead.
.5.1 Use the fairlead
~ on port side / starboard side.
~ amidships.
~ on port bow / starboard bow.
~ on port / starboard quarter.
.6 Send heaving line(s) to the tug(s).
.7 Send two towing line(s) to the tug(s).
.8 Lower towing line(s)
~ to the tug(s).
~ ... metre(s) from the water.
.9 Slack away towing line(s).
.10 Make fast the tug(s).
.10.1 Make fast the tug(s)
~ forward / aft.
~ on port bow / starboard bow.
~ on port quarter / starboard quarter.
.11 Make fast the forward / aft tug(s) alongside on port side / starboard side.
.12 Make fast ... tug(s) on each bow / quarter.
.13 Put the eyes of the towing line(s) on bitts.
.14 The tug(s) is / are fast (on ...).
.15 Keep clear of towing line(s).
.16 Stand by for letting go the tug(s).
.17 Let go the tug(s).
.18 Towing line(s) is/are broken.

AII/3.7 Berthing and unberthing

.1 **General**

.1 Is/are the propeller(s) clear?
.1.1 Yes, the propeller(s) is clear.
.1.2 No, the propeller(s) is not clear.
.1.3 Keep the propeller(s) clear.
.2 Are fenders on the berth?
.2.1 Yes, fenders are on the berth.
.2.2 No, fenders are not on the berth.
.3 Have fenders ready fore and aft.

.2 **Berthing**

.1 We will berth port side / starboard side alongside.
.2 We will moor
~ to buoy(s) (ahead and astern).
~ alongside.
~ to dolphins.
.3 Send out
~ the head / stern / breast lines.
~ the ... spring(s) forward / aft.
.4 Do you have tension winches?
.4.1 Yes, we have tension winches (forward and aft).
4.2 No, we do not have tension winches.
.5 Have the heaving lines ready forward and aft.
6 Send the heaving / head / stern / breast line(s) ashore.
.7 The linesmen will use shackles / lashings for securing the mooring.
.8 Use
~ the centre lead / panama lead .
~ the bow lead.
~ the port quarter / starboard quarter lead.
.9 Heave on the ... line(s) / ... spring(s)..
.10 Pick up the slack on the ... line(s) / ... spring(s)..
.11 Heave away.
.11.1 Stop heaving.
.12 Slack away / check the ... line(s) / ... spring(s)..
.13 Hold on the ... line(s) / ... spring(s).
.14 Heave in easy.
.14.1 Heave alongside.
.15 Keep the ... line(s) / ... spring(s) tight.
.16 Report the forward / aft distance to ... .
.16.1 The forward / aft distance to ... ... is metres.
.17 We have to move ... metres ahead / astern.
.18 We are in position.
.19 Make fast fore and aft.
.20 Finished with manoeuvring stations.

.3 **Unberthing**

.1 Stand by engine(s).
.2 Are you ready to get underway?

.2.1 Yes, we are ready (to get underway).
.2.2 No, we are not ready (yet) (to get underway).
.2.3 We will be ready to get underway in ... minutes.
.3 Stand by for letting go.
.4 Single up the ... lines and ... springs fore and aft.
.5 Slack away / hold on / heave on the
~ head / stern line.
~ breast line.
~ fore / aft spring.
.6 Let go
~ the head / stern line.
~ the breast line.
~ the fore / aft spring
~ all (forward / aft).
.7 Let go the towing line(s).
.8 Stand by bow anchor(s).
.9 Finished with manoeuvring stations.

STANDARD MARINE COMMUNICATION PHRASES PART B

PART B covers further on-board standard safety-related Phrases which, supplementary to PART A, may assist mariners in meeting other basic on-board communication requirements and may be regarded useful for Maritime English instruction.

B ON-BOARD COMMUNICATION PHRASES (B)

B1 Operative Shiphandling

B1/1 Handing over the watch

B1/1.1 Briefing on position, movement and draft

The officer of the watch should brief the relieving officer on the following:

.1 **Position**

.1 The present position is
~ latitude ..., longitude ... .
~ bearing ... degrees, distance ... kilometres / nautical miles.
~ buoy ...*(charted name)*.
~ between ... and... .
~ way point / reporting point ... .
~ ... .

.2 The next way point / reporting point is ... .

.3 ETA at ... is ... UTC.

.4 We are passing / we passed buoy ...*(charted name)* on port side / starboard side.

.5 We are approaching buoy ...*(charted name)* on port side / starboard side.

.6 Buoy ...*(charted name)* ... is kilometres / nautical miles ahead.

.7 We are entering / we entered area ... .

.8 We are leaving / we left area ... .

.2 **Movements**

.1 True course / gyro compass course / magnetic compass course is ... degrees.

.2 Gyro compass error is ... degrees plus / minus.

.2.1 Magnetic compass error is ... degrees east / west.

.3 Speed over ground / through water is ... knots.

.4 Set and drift is ... degrees, ... knots.

.5 We are making ... degrees leeway.

.6 The course board is written up.

.7 The next chart is within .... hours.

.3 **Draft**

.1 Draft forward / aft is ... metres.

.2 Present maximum draft is ... metres.

.3 Underkeel clearance is ... metres.

B1/1.2 Briefing on traffic situation in the area

.1 A vessel is
~ overtaking … (cardinal points) of us.
~ on opposite course.
~ passing on port side / starboard side.
.2 A vessel is crossing from port side.
.2.1 The vessel
~ will give way.
~ has given way.
~ has not given way yet.
~ is standing on.
~ need not give way.
.3 A vessel is crossing from starboard side.
.3.1 We
~ need not give way.
~ will stand on.
~ will alter course to give way.
~ have altered course to give way.
.3.2 The vessel will pass ... kilometres / nautical miles ahead / astern.
.3.3 I will complete the manoeuvre.
.4 A vessel … (cardinal points) of us is on the same course.
.5 The bearing to the vessel in ... degrees is constant.
.6 There is heavy traffic / ... in the area.
.6.1 There are fishing boats / ... in the area.
.7 There are no dangerous targets on the radar .
.7.1 Attention. There are dangerous targets on the radar .
.8 Call the Master if any vessel passes with a CPA of less than .... miles.
.8.1 Call the Master if ... .

B1/1.3 Briefing on navigational aids and equipment status

.1 Port side / starboard side radar is at ... miles range scale.
.2 The radar is
~ relative head-up / north-up / course-up.
~ true-motion north-up / course-up.
.3 GPS / LORAN is / is not in operation.
.4 Echo sounder is at ... metres range scale.
.4.1 The echo sounder recordings are unreliable.
.5 I changed to manual / automatic steering (at ... UTC).
.6 Navigation lights are switched on / off.

B1/1.4 Briefing on radiocommunications

.1 INMARSAT ...*(type of system)* is operational / is not operational.
.2 VHF DSC Channel 70 / VHF Channel ... / DSC controller is switched on.
.2.1 DSC frequency 2187.5 kHz is switched on.
.3 NAVTEX is switched on.
.4 Following was received on ... at ... UTC
.5 Shore based radar assistance / VTS / Pilot station is on VHF Channel ... .

.6 The Pilot station / VTS station requires
~ flag state.
~ call sign / identification.
~ draft.
~ gross tonnage.
~ length overall.
~ kind of cargo.
~ ETA at .... .
~ MAREP POSREP / ... .
~ ... .

B1/1.5 Briefing on meteorological conditions

.1 A weak / strong (tidal) current is setting .... degrees.
.1.1 The direction of the (tidal) current will change in ... hours.
.2 Fog / mist / dust / rain / snow / ... is in the area.
.3 Automatic fog signal is switched on.
.4 The wind increased / decreased (within last ... hours).
.4.1 The wind is ... *(cardinal points)* force Beaufort ... .
.4.2 The wind changed from .... *(cardinal points)* to .... *(cardinal points)*.
.5 The sea state is expected to change (within .... hours).
.6 A smooth/moderate/rough/heavy sea / slight/moderate/high swell of ... metres from ...*(cardinal points)* is expected (within .... hours).
.7 A tsunami / an abnormal wave is expected by ... UTC.
.8 Visibility is ...kilometres/ nautical miles.
.9 Visibility is reduced by fog / mist / dust / rain / snow / ... .
.10 Visibility is expected
~ to decrease / increase to ...kilometres / nautical miles (within ... hours).
~ variable between ... and ... kilometres / nautical miles (within .... hours).
.11 Next weather report is at ... UTC.
.12 Atmospheric pressure is ... millibars/hPascal.
.13 Barometric change is ... millibars /hPascal per hour / within the last ... hours.
.13.1 Barometer is steady / dropping (rapidly) / rising (rapidly).
.14 There was a gale warning / tropical storm warning for the area ... at ... UTC.

B1/1.6 Briefing on standing orders and bridge organization

.1 Standing orders for the period from ... to ... UTC ... are: ... .
.2 Standing orders for the area ... are: ... .
.3 Take notice of changes in the standing orders.
.4 Do you understand the standing orders?
.4.1 Yes, I understand the standing orders.
.4.2 No, I do not understand, please explain.
.5 Read / sign the standing orders.
.6 The latest fire patrol was at ... UTC.
.7 The latest security patrol was at ... UTC.
.7.1 Everything is in order.
.7.2 The following was stated: ... .
.7.3 The following measures were taken: ... .
.7.4 The following requires attention: ... .
.8 The lookout is standing by.
.9 The helmsman is standing by.
.10 Call the Master at ... UTC / in position ... .

B1/1.7 Briefing on special events

Also see AI/3 A Safety communications≅.

.1 There was an engine alarm at ... UTC due to .....
.2 Speed was reduced at ... UTC due to .....
.3 Engine(s) was / were stopped at ... UTC due to .....
.4 Course was altered at ... UTC due to ....
.5 The Master / Chief Engineer was called at ... UTC due to ... .

B1/1.8 Briefing on temperatures, pressures and soundings

.1 The ...(equipment*)* temperature minimum/maximum is
~ ... degrees (centigrade) /to maintain.
~ ... above / below normal.
~ critical.
.1.1 Do not exceed a minimum/maximum temperature of … degrees.
.2 The ...(equipment*)* pressure minimum/maximum is
~ ... kiloponds / bars/to maintain.
~ above / below normal.
~ critical.
.2.1 Do not exceed a pressure of … kiloponds / bars.
.3 Ballast / fresh water/ fuel / oil /slop sounding is ... metres / cubic metres.
.3.1 Sounding of
~ no ... cargo tank is ... metres / cubic metres.
~ no ... cargo hold is ... centimetres.
~ ... .

B1/1.9 Briefing on operation of main engine and auxiliary equipment
Also see B1/1.8.

.1 (present) revolutions of the main engine(s) are ... per minute.
.2 (present) output of the main engine(s) / auxiliary engine(s) are ... kilowatts.
.3 (present) pitch of the propeller(s) is ... degrees.
.4 There are no problems.
.5 There are problems with ... .
~ with the main engine(s) / auxiliary engine(s).
~ with ... .
6 Call the watch engineer (if the problems continue).
.6.1 Call the watch engineer ... minutes before the arrival at ... / at ... UTC.

B1/1.10 Briefing on pumping of fuel, ballast water, etc.

.1 There is no pumping at present.
.2 We are filling / we filled (no.) ... double bottom tank(s) / the ballast tanks / the ... tank(s).
.2.1 Fill up … tonnes/ sounding …/ ullage …/ level … to the alarm point.
.3 We are discharging / we discharged (no.) ... double bottom tank(s) / the ballast tanks / the ... tank(s).
.4 We are transferring / we transferred fuel / ballast / fresh water / oil from (no.) ... tank(s) to (no.) ... tank(s).
.5 We require a further generator to operate an additional pump.

B1/1.11 Briefing on special machinery events and repairs

.1 There was a breakdown of the main engine(s) (at ... UTC / from ... to ... UTC).
.1.1 There was a breakdown of ... (at ... UTC / from ... to ... UTC).
.2 There was a total blackout (at ... UTC / from ... to ... UTC).
.2.1 There was a blackout in ...(at ... UTC / from ... to ... UTC) .
.3 Main engine(s) was / were stopped (at ... UTC / from ... to ... UTC) due to ... ..
.4 Speed was reduced (at ... UTC / from ... to ... UTC) due to ... .
.5 Call the Master / Chief engineer if the revolutions of the main engine(s) are below ... per minute.
.5.1 Call the Master / Chief Engineer / watch engineer if ... .

B1/1.12 Briefing on record keeping

.1 The log books / record books are completed and signed.
.1.1 The note book entries will be copied (into the log books / record books) after the watch.
.2 Change the paper of the data logger / echo sounder / ... recorder.
.2.1 Refill the toner / ink of the data logger / echo sounder / ... recorder

B1/1.13 Handing and taking over the watch / conn

The Master / Chief Engineer or an (engineer) officer handing over the watch should say:
.1 You have the watch now.

The relieving officer should confirm and say:
.1.1 I have the watch now .≅

The Master / Chief Engineer when called to the bridge / engine (control) room and formally taking over the watch, should confirm and say:
.2 I have the watch now.

The officer of the watch should confirm and say:
.2.1 You have the watch now.

B1/2 Trim, List and Stability

1 The vessel is on even keel (at present).
.1.1 The vessel is ... metres down by the head / stern (at present).
.2 There is no list (at present).
.2.1 (present) list is ... degrees to port / starboard.
.3 Fuel / ballast / fresh water / oil was transferred from (no.) ... tank(s) to (no.) ... tank(s) to correct the list.
.3.1 We must transfer fuel / ballast / fresh water / oil from (no.) ... tank(s) to (no.) ... tank(s) to correct the list.
.4 Deck cargo / cargo was restowed (in (no.) ... hold(s)) to correct the list.
.4.1 We must restow cargo in (no.) ... hold(s) to correct the list.
.5 (present) stability is good / poor.
.6 (no.) ... double bottom tank(s) was / were filled to improve the stability.

.7 Fuel / ballast / fresh water / oil was transferred from (no.) ... tank(s) to (no.) ... tank(s) to improve the stability.
.7.1 We must transfer fuel / ballast / fresh water/ oil from (no.) ... tank(s) to (no.) ... tank(s) to improve the stability.
.8 Cargo was restowed in (no.) ... hold(s) / on deck to improve the stability.
.8.1 We must restow cargo in (no.) ... hold(s) / on deck to improve the stability.
.9 Containers were restowed from ... to ... to improve the stability.
.9.1 We must restow containers from ... to ... to improve the stability.

B2 Safety on Board

B2/1 General Activities

The phrases of this section apply to most of the emergencies covered in this chapter.

B2/1.1 Raising alarm

.1 Operate the general emergency alarm.
.2 Inform the Master / Chief Engineer /... .
.3 Inform the ... coast radio station / vessels in vicinity (on radio).
.4 Request assistance (on radio) from ... and report.
.4.1 Assistance was
~ requested from ... .
~ offered by ... .
~ accepted from ... .
.5 Transmit a SECURITE / PAN-PAN / distress alert / MAYDAY and report.
.5.1 A SECURITE / PAN-PAN / distress alert / MAYDAY was transmitted.
.6 Was the distress alert / MAYDAY acknowledged?
.6.1 Yes, the distress alert / MAYDAY was acknowledged by ... coast radio station / MRCC / vessel(s) in vicinity.
.6.2 No, the distress alert was not acknowledged (yet).
.6.1.1 Repeat the distress alert.

B2/1.2 Briefing crew and passengers

Also see B4 " Passenger Care".

.1 Make the following announcement (on the PA - system):
.2 This is your Captain speaking.
.2.1 We have grounded / a minor flooding / a minor fire in ... .
.2.2 There is no immediate danger to crew, passengers or vessel - and there is no reason to be alarmed.
.2.3 For safety reasons I request all crew members to go to their assembly stations.
.2.3.1 All officers to report to the bridge.
.2.3.2 Watchkeepers remain at stations until further order.
.2.4 As soon as I have further information I will make another announcement - there is no danger at this time.
.2.5 Fire fighting teams / damage control teams are fighting the fire / flooding.
.2.6 We also have radio contact with other vessels / coast radio stations.
.2.7 The fire / flooding is under control.

.3 This is your Captain speaking. I have another announcement:
.3.1 The fire / flooding is not under control yet.
.3.2 Leave the engine room / superstructure / your stations / your cabins / ... immediately - close all openings.
.3.3 Take lifejackets with you.
.3.3.1 Take your emergency equipment with you according to the muster list.
.3.4 Stand by fire fighting stations / damage control stations and report.
.3.4.1 Fire fighting stations / damage control stations are standing by.
.3.5 All crew members to assembly stations.
.3.6 Follow the escape routes shown.
.3.7 The route to the assembly station is ... not clear.
.3.7.1 The route to the assembly station will be via ... .
.3.8 Assemble
~ on deck.
~ on the foredeck / afterdeck.
~ on the ... deck on port side / starboard side.
~ on the ... deck forward of ... / aft of ... .
.3.9 Do not
~ go to the lifeboat / liferaft stations before ordered.
~ enter the lifeboats / liferafts - the order to enter will be given from the bridge / by the officers.
.3.10 The following department(s) / crew members will (temporarily) disembark for safety reasons.

B2/1.3 Checking status of escape routes

.1 Check the escape routes and report.
.1.1 All escape routes are clear.
.1.2 The escape route(s) from ... (to ...) / via ... is / are blocked / not clear (yet).
.1.3 The escape route(s) from ... (to ...) / via ... will be clear in ... minutes..

B2/1.4 Checking status of lifeboats / liferafts

.1 Check the launching tracks and report.
.1.1 All launching tracks are clear.
.1.2 The launching track(s) of no. ...lifeboat / liferaft is / are not clear (yet).
.1.3 The launching track(s) of no. ... lifeboat / liferaft will be clear in ... minutes.
.2 Check the working parts and report.
.2.1 All working parts are free.
.2.2 The roll(s) / block(s) / rigging / ... of no. ...lifeboat is / are not free (yet).
.2.3 The roll(s) / block(s) / rigging / ... of no. ... lifeboat will be free in ... minutes.
.3 Check the securings of the launching appliances and report.
.3.1 All securings are in the correct position.
.3.2 The securing of no. ... lifeboat / liferaft is not in the correct position.
.3.2.1 Correct the position of the securing .
.3.3 The securing of no. ... lifeboat / liferaft is damaged.
.3.3.1 Replace / repair the securing.
.3.4 The harbour pin(s) of no. ...lifeboat is / are missing.
.3.4.1 Replace the harbour pin(s).

.4 Check the fuel / oil of the lifeboat engine(s) and report.
.4.1 The fuel tank of no. ...lifeboat engine is full / not full.
.4.1.1 Fill up fuel.
.4.2 The oil level of no. ... lifeboat engine is normal / below normal.
.4.2.1 Fill up oil.
.5 Operate the lifeboat engine(s) and report.
.5.1 All lifeboat engines are operational.
.5.2 No. ... lifeboat engine is not operational (yet).
.5.3 No. ... lifeboat engine will be operational in ... minutes.
.6 Check the bilge pumps of the lifeboats and report.
.6.1 All bilge are operational.
.6.2 The bilge pumps of no. ... lifeboat are not operational (yet).
.6.3 The bilge pumps of no. ... lifeboat will be operational in ... minutes.
.7 Check the drain plugs and report.
.7.1 All drain plugs are available.
.7.2 The drain plug(s) in no. ... lifeboat is / are missing.
.7.2.1 Replace the drain plug(s).
.8 Check the slip gear in the lifeboats and report.
.8.1 All slip gear is in the correct position and secured.
.8.2 The slip gear of no. ... lifeboat is not in the correct position.
.8.2.1 Correct the position of the slip gear.
.8.3 The slip gear of no. ... lifeboat is not secured.
.8.3.1 Secure the slip gear.
.9 Check the lifeboat equipment and report.
.9.1 All lifeboat equipment is complete and operational.
.9.2 The lifeboat equipment is not complete.
.9.2.1 Complete the lifeboat equipment..
.10 Launch / hoist no. ... lifeboat(s) and report.
.10.1 The launching appliances are operational.
.10.2 The launching appliances are not operational.
.10.3 No. ... winch / davit is not operational (yet).
.10.3.1 No. ... winch / davit will be operational in ... minutes.
.10.4 Hoist no. ... lifeboat(s).
.11 Secure the lifeboat(s) and report.
.11.1 Lifeboat(s) is / are secured .
.12 Check the liferafts and report.
.12.1 All liferafts are in position and operational.
.12.2 No. ... liferaft(s) is / are not operational.
.12.3 The inflation cord of no. ... liferaft is not secured on board.
.12.3.1 Secure the inflation cord.
.12.4 No. ... liferaft container is damaged.
.12.4.1 Replace the liferaft container in the next port.
.12.5 The inspection tag of no. ... liferaft is expired.
.12.5.1 Replace the liferaft in the next port.

B2/1.5 Ordering evacuation

.1 Evacuate all rooms / spaces / decks / ... and report.
.1.1 All rooms / spaces / decks / ... evacuated.
.2 Evacuate engine room and report.
.2.1 Engine room evacuated.

.3 Evacuate no. ... hold(s) / tank(s) and report.
.3.1 No. ... hold(s) / tank(s) evacuated.
.4 Evacuate superstructure and report.
.4.1 Superstructure evacuated.
.5 Evacuate accommodation and report.
.5.1 Accommodation evacuated.
.6 Do not enter ... deck / space / area.
.7 Report missing persons / injured persons / casualties.
.7.1 No persons missing / injured.
.7.2 Number of missing persons / injured persons / casualties is:... .
.7.3 ... deck / space / area not accessible (yet).
.8 Provide first aid (in the vessel's hospital / at a safe place).
.8.1 Request medical assistance from ... (on radio).
.9 All persons are outside the danger area.

B2/1.6 Roll call

.1 Report number of all persons / passengers / crew members at assembly stations.
.1.1 Number of all persons / passengers / crew members at assembly station ...is ... .
.1.2 Number of persons / passengers / crew members at assembly station ... is complete.
.1.3 Number of persons / passengers / crew members at assembly station ... is not complete (yet).
.1.4 ... passenger(s) / crew member(s)is / are missing.
.2 Search for missing passenger(s) / crew member(s) and report.
.2.1 Missing passenger(s) / crew member(s) recovered.
.2.2 Missing passenger(s) / crew member(s) not recovered (yet)-(search is continuing).
.3 Watchkeepers to assembly stations.
.4 Lifeboatmen! Check the equipment of the crew at assembly stations and report.
.4.1 Equipment of the crew at assembly station ... is complete.
.4.2 Equipment of the crew at assembly station ...is not complete (yet).
.4.3 Complete the equipment and report.
.4.3.1 Go for blanket / stretcher / ... and report.
.5 Lifeboatmen! Check the outfit of the passengers at assembly stations and report.
.5.1 Outfit of the passengers at assembly station ... is correct.
.5.2 Outfit of the passengers at assembly station ... is not correct (yet).
.5.2.1 Correct the outfit and report.
.5.2.2 Put on warm clothing / long sleeved shirt / long trousers / strong shoes / head covering / ... and report.
.6 Passengers and crew ! Follow the lifeboatmen to the lifeboat stations / liferaft stations on the embarkation deck.

B2/1.7 Ordering abandon vessel

.1 Swing out no. ... lifeboat(s) and report.
.1.1 No. ... lifeboat(s) swung out.
.2 Lower no. ... lifeboat(s) alongside the embarkation deck and report.
.2.1 No. ... lifeboat(s) is / are alongside the embarkation deck.
.3 Enter the lifeboat(s) (no. ...) and report.
.3.1 Enter the lifeboat(s) / liferaft(s) over the ... deck.
.3.2 Enter the lifeboat(s) / liferaft(s) over the ladders / nets / manropes.
.3.3 Jump into the water and enter the lifeboat(s) / liferaft(s).
.3.4 Jump onto the liferaft(s) alongside the vessel.

.3.5 Do not push each other when entering.
.3.6 Assist injured / helpless persons.
.3.7 Clear the entrance of the lifeboat / liferaft.
.3.8 Sit down in the lifeboat / liferaft immediately.
.3.9 Hold on to the ropes or to your seat when launching.
.4 No. ... lifeboat(s) / liferaft(s) entered.
.5 Let go no. ... lifeboat(s) / liferaft(s) and report.
.5.1 No. ... lifeboat(s) / liveraft(s) is / are let go.
.6 Throw over board no. ... liferaft and report.
.6.1 No. ... liferaft thrown over board.
.7 Inform coast radio stations / vessels in vicinity about the number of lifeboats / liferafts launched and report.
.7.1 Inform coast radio stations / vessels in vicinity about the number of persons in each lifeboat / liferaft and report.
.7.2 Inform coast radio stations / vessels in vicinity about the number of crew members remaining on board.
.7.3 Coast radio station ... / vessels in vicinity informed.
.8 Stand clear of the vessel and report.
.8.1 No. ... lifeboat(s) / liferaft(s) standing clear.
.8.2 No. ... lifeboat(s) / liveraft(s) not standing clear.
.9 Rescue boat / no. ...motor lifeboat!
Assist no. ... lifeboat(s) / liferaft(s) and report.
.9.1 Rescue boat / no. ... motor lifeboat is assisting.
.9.2 No. ... lifeboat(s) / liferaft(s) standing clear of the vessel now.

B2/1.8 In - boat procedures
Also see: B4 " Passenger Care" 2.5 and 2.6.

.1 Stand by engine / pumps / lookout / entrance and report.
.1.1 Engine/ pumps / lookout / entrance is / are standing by.
.2 Recover persons in water and report.
.2.1 Number of persons recovered is: ... .
.2.2 Keep lookout for further persons in water.
.2.3 Report the total number of persons in lifeboat(s) / liferaft(s).
.2.3.1 The total number of persons is now: ... .
.3 Report the number of injured persons.
.3.1 No persons injured.
.3.2 The number of injured persons is: ... .
.3.3 Provide first aid to injured persons .
.3.4 Secure injured / helpless persons.
.4 Let go sea anchor and report.
.4.1 Sea anchor is let go.
.5 Report the number of lifeboats / liferafts in sight.
.5.1 The number of lifeboats / liferafts in sight is: ... .
.6 Contact the lifeboat(s) / liferaft(s) on radio and report.
.6.1 Lifeboat(s) / liferaft(s) contacted.
.6.2 No contact possible.
.7 Give distress signals for identification.
.7.1 Fire rockets for identification.
.7.2 Use glasses / lamps / mirrors for identification.
.7.3 Give sound signals / ... signals for identification.
.8 Start the engine. and report.
.9 Set sail.

.10 Use oars.
.11 Join the other lifeboat(s) / liferaft(s).
.11.1 Connect the lifeboats / liferafts with lines and report.
.11.2 ... lifeboats / liferafts connected.

B2/2 Occupational Safety

B2/2.1 Instruction

.1 Prepare a training plan for occupational safety.
.2 When was the last training session on occupational safety?
.2.1 The last training session was on ... *(date)*.
.3 When is the next training session on occupational safety?
.3.1 The next training session is on ... *(date)*.
.4 Are new crew members / passengers instructed on occupational safety?
.4.1 Yes, new crew members / passengers are instructed.
.4.2 No, new crew members / passengers are not instructed (yet).
.4.3 Instruct new crew members / passengers by ...*(time)* / on ...*(date)*.
.5 Participation in training sessions on occupational safety is mandatory.

B2/2.2 Practical occupational safety

.1 Instruct crew on occupational safety before departure.
.2 Have special instruction on dangerous goods / heavy lifts/ cargo securing / illumination / ventilation / ... .
.3 Where are dangerous goods carried on board?
.3.1 Dangerous goods of IMO Class ... are carried
~ on deck (in roped-off areas).
~ in no. ... hold(s).
~ in ... /on... .
.4 Prepare an emergency plan.
.5 Brief all crew members / passengers on the symptoms caused by dangerous substances.
.6 What signals / communications are used in case of emergency ?
.6.1 The following signals / communications are used in case of emergency: ... .
.7 Brief all crew members / passengers
- about restricted areas.
- how to report in / out (when entering / leaving bridge / engine room / ...).
.8 Do not enter the unmanned (engine) room /... space without permission.
.8.1 Report on telephone / radio / ... while in the (engine) room /... space every ... minutes.
.9 Brief all crew members / passengers on the storm.
.9.1 Attention!
Entering the forecastle / main deck / weather side / ... of the vessel is prohibited / dangerous (due to storm).
.9.2 Attention!
Make use of hand rails and lifelines in corridors and on deck.
.9.3 Attention!
Close all dead lights and storm doors.
.9.4 Attention!
Secure all loose objects in your cabins / on deck / in ... .
.10 Brief all crew members / passengers on winter conditions / tropical conditions.
.12 Check the completeness and availability of the occupational safety equipment

and report.
.12.1 Occupational safety equipment is complete and available.
.12.2 Following occupational safety equipment is not complete / available: ...
.12.3 Occupational safety equipment will be complete and available in ... hour(s).
.13 Appoint an officer / a crew member in charge of safety before working.
.14 Take additional safety measures for the
~ work on masts.
~ work outboard.
~ work in hold(s) / tank(s).
~ work in extreme weather conditions / ... .

B2/2.3 Occupational accidents

.1 Accident in engine room / in no. ... hold / in no. ... tank / in superstructure/ in accommodtaion / in ... space / on deck / outboard / on pier / on ... / in ... .
.2 Report injured persons / casualties:
.2.1 No person injured.
.2.2 The number of injured persons / casualties is: ... .
.3 What happened?
.3.1 Explosion / fire in ... .
.3 .2 Accident with cargo.
.3.3 Fall from .../ into ... .
.3.4 Electrical accident in ... .
.3.5 Leakage of gas / ... .
.3.6 ... .
.4 Take immediate action to recover injured person(s) / casualties.
.4.1 Provide first aid.
.4.2 Take immediate action to control the danger area.
.5 What kind of assistance is required?
.5.1 No assistance is required.
.5.2 Medical / technical assistance is required.
.5.3 Shoreside assistance is required.
.6 Secure the danger area and report.
.6.1 The danger area is secured.
.7 Prepare an accident report.

B2/3 Fire Protection and Fire Fighting

B2/3.1 Fire protection

.1 **Checking status of equipment**

.1 Have fire patrols (every ... hour(s) / ... time(s) every watch).
.1.1 Have fire patrols
~ in all spaces.
~ in the engine room / cargo hold(s) / superstructures / accommodation/ ... .
~ on deck.
.1.2 Have a permanent fire watch.
.2 Is everything in order?
.2.1 Yes, everything is in order.
.2.2 No, following is not in order: ... .
.3 Check the fire / smoke alarm(s) and report.
.3.1 All fire / smoke alarms are operational.

.3.2 Fire / smoke alarm(s) in ... is / are not operational (yet).
.3.3 Fire / smoke alarm(s) in ... will be operational in ... minutes.
.4 Check the portable extinguishers and report.
.4.1 All portable extinguishers are in position and operational.
.4.2 The portable extinguishers in ...
~ are not in position (yet)..
~ will be in position in ... minutes..
~ are not accessible (yet).
~ will be accessible in ... minutes.
~ are missing.
.4.2.1 Replace the missing portable extinguisher(s).
.4.3 The inspection tag(s) of the portable extinguisher(s) in ... is / are broken / expired.
.4.3.1 Replace the portable extinguisher(s) with broken / expired inspection tag(s).
.5 Check the fire mains and report.
.5.1 All fire mains are operational.
.5.2 The hydrant(s) in ... is / are not operational (yet)..
.5.2.1 The hydrant(s) will be operational in ... minutes.
.5.3 The hose(s) to hydrant(s) in ... is / are worn / cut.
.5.3.1 Replace the worn / cut hose(s).
.5.4 The hose(s) / spanner (s) / nozzle(s) to hydrant(s) in ... is / are missing.
.5.4.1 Replace the missing hose(s) / spanner(s) / nozzles(s).
.5.5 The fire pump(s) in ... is / are not operational (yet).
.5.5.1 Fire pump(s) in ... will be operational in ... minutes.
.5.6 The water pipe(s) in ... is / are leaking.
.5.6.1 Repair the leaking water pipe(s) in ... .
.5.7 The water pipe(s) in ... is / are blocked.
.5.7.1 Free the blocked water pipe(s) in ... .
.5.8 Pressure in the water pipe(s) in ... is too high / low.
.5.8.1 Reduce / increase pressure in the water pipe(s)in ... .
.6 Check the fixed foam / gas fire extinguishing system and report.
.6.1 The fixed foam / gas system is operational.
.6.2 The fixed foam/gas system is not operational (yet)
.6.2.1 The fixed foam / gas system will be operational in ... minutes.
.7 Check the sprinkler system and report.
.7.1 The sprinkler system is operational.
.7.2 The sprinkler system in ... is not operational (yet).
.7.2.1 The sprinkler system in ... will be operational in ... minutes.
.8 Check the ventilation system and report.
.8.1 The ventilation system is operational.
.8.2 The ventilation system is not operational (yet)
.8.2.1 The ventilation system will be operational in ... minutes.
.8.3 The remote control is not operational (yet).
.8.3.1 The remote control will be operational in ... minutes
.8.4 The indicators are not operational (yet).
.8.4.1 The indicators will be operational in ... minutes.
.8.5 The fire dampers in ... are not operational (yet).
.8.5.1 The fire dampers in ... will be operational in ... minutes.
.8.6 The fire dampers in ... are painted stuck.
.8.6.1 Clear the fire dampers.
.9 Check the skylights / windows / ... and report.
.9.1 The skylights / windows / ... in / to ... are open.
.9.1.1 Close the skylights / windows / ... in / to ... .

.10 Check the watertight door control and report.
.10.1 The watertight door control is operational.
.10.2 The watertight door control in ... is not operational (yet).
.10.3 The watertight door control in ... will be operational in ... minutes.
.11 Check the electrical lighting and report
.11.1 The electrical lighting is operational.
.11.2 The electrical lighting in ...is not operational (yet).
.11.3 The electrical lighting in ... will be operational in ... minutes.
.11.4 Switch on / off the electrical lighting in ... .
.12 Check the emergency power supply and report.
.12.1 The emergency power supply is operational.
.12.2 The emergency power supply is not operational (yet).
.12.3 The emergency power supply will be operational in ... minutes.
.13 Check the firemen´s outfits and report.
.13.1 All firemen´s outfits are complete and available.
.13.2 The firemen´s outfits are not complete.
.13.2.1 Complete the firemen´s outfits.

B2/3.2 Fire fighting and drills

.1 **Reporting fire**

.1 Fire on board!
.1.1 Smoke / fumes / fire / explosion
~ in engine room.
~ in no. ... hold(s) / tank(s).
~ in superstructure / accommodation.
~ in ... space.
~ on deck / ... .
.1.2 Smoke / fumes from ventilator(s).
.1.3 Burnt smell / fumes in .../ from... .
.2 Report injured persons / casualties:
.2.1 No person injured.
.2.2 Number of injured persons / casualties is: ... .
.3 What is on fire?
.3.1 Fuel / cargo / car(s) / truck(s) / waggon(s) / containers (with dangerous goods) / ... on fire.
.3.6 No information (yet).
.4 Is smoke toxic?
.4.1 No, smoke not toxic.
.4.2 Yes, smoke toxic
.5 Is fire under control?
.5.1 Yes, fire (in ...) under control.
.5.2 No, fire (in ...) not under control (yet).
.5.2 .1 Fire spreading (to ...).
.5.2.2 Fire (in ...) not accessible.
.6 Report damage.
.6.1 No damage.
.6.2 Minor / major damage in .../ to ... .
.6.3 No power supply (in ...).
.6.4 Making water in ... .
.7 Pressure on fire mains!
.8 Shut down main engine(s) / auxiliary engine(s) / ... and report.

.8.1 Main engine(s) / auxiliary engine(s) / ... shut down.
.9 Stop fuel and report.
.9.1 Fuel stopped.
.10 Close all openings (in ... / in all rooms) and report.
.10.1 All openings (in ... / in all rooms) closed.
.10.1.1 Openings in ... not accessible.
.11 Switch off ventilator(s) (in ...) and report.
.11.1 Ventilator(s) (in ...) switched off.
.12 Turn bow / stern to windward.
.13 Turn port side / starboard side to windward.
.14 Alter course to ... .

.2 **Reporting readiness for action**

.1 Stand by fire fighting team / rescue team / first aid team / support team and report.
.1.1 Fire fighting team / rescue team / first aid team / support team standing by.
.2 Stand by main engine and report.
.2.1 Main engine standing by.
.3 Stand by CO_2 station / ... station/ emergency generator.
.3.1 CO_2 station / ... station / emergency generator standing by.
.4 Close all openings (in ... / in all rooms) and report.
.4.1 All openings (in ... / in all rooms) closed.
.4.1.1 Openings in ... not accessible.

.3 **Orders for fire fighting**

.1 Start fire fighting.
.1 .1 Take one / two / ... fire fighting teams / ... team(s) to scene.
.2 Go following route:
.2.1 Go through engine room / no. ... hold(s)/tank(s) / superstructure / accommodation / ... space / manhole(s) to ... space / funnel / ... .
.2.2 Go from
~ outside / inside to ... .
~ port side / starboard side to ... .
~ ... to ... .
.3 Take following (additional) safety measures and report.
.3.1 Have two / ... members in one team.
.3.1.1 Number of members in fire fighting team / ... team is: ... .
.3.2 Have lifeline between each other / to outside.
.3.2.1 ... team members have lifelines to each other.
.3.2.2 ... team has lifelines to outside.
.3.3 Have rescue team on stand by.
.3.4 Maintain visual contact / radio contact on walkie-talkie.
.4 Fire fighting team must have following outfit:
.4.1 Fire fighting team must have protective clothing / smoke helmets / breathing apparatus / ... .
.5 Manning of fire fighting team / ... team(s) as follows:
.5.1 Chief Officer / Chief Engineer / ... in command of fire fighting team / ... team (no. ...).
.5.2 Following officer(s) / crew member(s) in fire fighting team /... team: ...
.6 Restrict action (in .../ on ...) to ... minutes.
.6.1 Agree on retreat signal and report.
.6.1.1 Retreat signal for fire fighting team / ... team ... is ... .

.7 Use water / foam / powder / CO2 / sand / ... in ... .
.8 Run out fire hoses and report.
.8.1 Fire hoses run out.
.9 Water on!
.9.1 Water is on.
.10 Cool down ... with water and report.
.10.1 ... cooled down.

.4 **Cancellation of alarm**

.1 Is the fire extinguished?
.1.1 Yes, fire (in ...) extinguished.
.1.2 No, fire (in ...) not extinguished (yet).
.1.3 Fire restricted to ... space / area.
.2 Post a fire watch and report.
.2.1 Fire watch posted (in ...space / area).
.3 Fire extinguishing systems / means remain on stand-by.
.4 Fire fighting team / ... team remain on stand-by.
.5 Rope-off the fire area and report.
.5.1 Fire area roped-off.
.6 Check the fire area every ... minutes / hour(s) for re-ignition and report.
.6.1 Fire area checked, no re-ignition.
.6.2 Fire area checked, re-ignition in ... space / area.
.6.2.1 Re-ignition extinguished.
.7 The fire alarm is cancelled (with following restrictions: ... .)

B2/4 Damage Control
Also see B2/1 "General Activities".

B2/4.1 Checking equipment status and drills

.1 Check the openings in all spaces / in ... and report
.1.1 All openings in ... are closed.
.1.2 Openings in ... are not closed (yet).
.1.3 Openings in ... are not accessible.
.2 Check the watertight door control and report
.2.1 Watertight door control
~ is operational.
~ (in ...) is not operational (yet).
~ (in ...) will be operational in ... minutes.
.2.2 Watertight door(s) (in ...) is / are not accessible.
.3 Check the pumps / emergency generator and report
.3.1 (Bilge) pump(s) in ... / emergency generator
~ is / are operational.
~ is / are not operational (yet).
~ will be operational in ... minutes.
.4 Check the power supply and report
.4.1 Power (in / at ...)
~ is available.
~ is not available (yet).
~ will be available in ... minutes.
.5 Check the damage control equipment and report.
.5.1 All damage control equipment is complete and available.

.5.2 Damage control equipment is not complete.
.5.2.1 Complete the damage control equipment.

B2/4.2 Damage control activities

.1 **Reporting flooding**

.1 We have collided (with ...) .
.2 We have flooding in ... .
.3 Is flooding under control ?
.3.1 Yes, flooding under control.
.3.2 No, flooding (in ...) not under control (yet).
.4 Is danger imminent ?
.4.1 No, danger not imminent.
..4.2 Yes, danger of (total) blackout (in ...).
.4.3 Yes, danger of heavy listing / capsizing / sinking / ... .

.2 **Reporting readiness for action**

.1 Muster damage control team and report.
.1.1 Damage control team complete and mustered.
.2 Is damage control material available?
.2.1 Yes, damage control material available.
.2.2 No, damage control material not available (yet).
.2.3 Damage control material will be available in ... minutes.
.3 Stand by engine room / ... station and report.
.3.1 Engine room / ... station standing by.
.3.2 Engine room / ... station flooded.
.3.3 Engine room / ... station will be standing by in ... minutes.

.3 **Orders for damage control**

.1 Close all openings / outlets / valves (in ...) and report.
.1.1 All openings / outlets / valves (in ...) closed.
.1.2 Openings / outlets / valves in ... not accessible / not operational.
.2 Switch on / off power (at / on / in) and report.
.2.1 Power (at / on / in ...) switched on / off.
.2.2 Power supply (at / on / in ...) not operational.
.3 Close watertight door(s) (in ...) (by hand) and report.
.3.1 Watertight door(s) (in ...) closed.
.3.2 Watertight door(s) (in ...) not accessible / not operational.
.4 Switch on (bilge) pump(s) (in ...)and report.
.4.1 (Bilge) pump(s) (in ...) switched on.
.4.2 (Bilge) pump(s) (in ...) not operational.
.5 Switch over (bilge) pump(s) from ... to ... .
.5.1 (Bilge) pump(s) switched over.
.5.2 Switching over (bilge) pump(s) not possible.
.6 Start damage control.
.6.1 Take one / two / ... damage control team(s) to scene.
.7 Go following route: ... .
.7.1 Go through engine room / no. ... hold(s)/tank(s) / superstructure / manhole / ... space / ... deck / ... .
.8 Go from

~ outside / inside to ... .
~ port side / starboard side to ... .
~ ... to ... .

.9 Take following (additional) safety measures and report.
.9.1 Have two / ... members in one damage control team.
.9.2 Have lifeline to each other / to outside.
.9.3 Have rescue team on stand by and report.
.9.3.1 Rescue team standing by.
.9.4 Maintain visual contact / radio contact on walkie-talkie.
.10 Damage control team must have following outfit(s).
.10.1 Damage control team must have
~ protective clothing
~ safety helmets.
~ lifejackets.
~ diving equipment / ... .
.11 Manning of damage control team as follows: ... .
.11.1 Chief Officer / Chief Engineer / ... in command of damage control team (no. ...) ...
.11.2 Following officer(s) / crew member(s) in damage control team (no. ...):.. .
.12 Restrict action (in ...) to ... minutes.
.12.1 Agree on retreat signal and report.
.12.1.1 Retreat signal ... .
.13 Stop flooding from inside / outside (... space / area) and report.
.13.1 Flooding stopped
.13.2 Stopping flooding from inside / outside not possible.

.4 **Cancellation of alarm**

.1 Has flooding stopped ?
.1.1 Yes, flooding (in ...) has stopped.
.1.2 No, flooding (in ...) has not (completely) stopped (yet).
.2 Is flooding under control ?
.2.1 Yes, flooding (in ...) under control.
.2.2 Flooding (in ...) below / above capacity of (bilge) pump(s).
.2.3 Flooding restricted to ... space / area.
.3 Post damage control watch and report.
.3.1 Damage control watch posted (in ...).
.4 How much water is in the vessel ?
.4.1 Quantity of water (in ...) about ... tonnes.
.4.2 Quantity of water (in ...) not dangerous.
.5 (Bilge) pump(s) remain on stand by.
.6 Engine room remains on stand by.
.7 Additional emergency generator remains on stand by.
.8 Damage control team remains on stand by.
.9 Rope - off flooded area.
.10 Check leak every ... minutes / hour(s) and report.
.10.1 Leak checked - no flooding.
.10.2 Leak checked - minor / major flooding (in ...).
.10.2.1 Flooding has stopped.
.11 The alarm is cancelled (with following restrictions: ...).

B2/5 Grounding
Also see B2/1 "General Activities"

B2/5.1 Reporting grounding and ordering actions

.1 We are aground.
.2 Stop engine(s).
.3 Close watertight doors and report.
.3.1 Watertight doors closed.
.4 Is vessel (still) making way ?
.4.1 Yes, vessel making way ahead / astern.
.4.2 No, vessel not making way.
.5 Give "vessel aground" signals.
.6 Inform engine room.
.7 What part is aground ?
.7.1 Vessel aground forward / amidships / aft / full length.
.8 Stand by forward station and aft station and report.
.8.1 Forward station / aft station standing by.
.9 Stand by port anchor / starboard anchor.
.10 What is position ?
.10.1 Position ... .

B2/5.2 Reporting damage

.1 Report damage.
.1.1 No damage.
.1.2 Crack(s) in plating / no. ... double bottom / no. ... hold(s) / tank(s) / main/auxiliary engine(s) foundation / ... .
.1.3 Deformation(s) / indentation(s) to plating / to ... .
.1.4 Deformation(s) / indentation(s) to ... .
.2 Check flooding and report.
.2.1 No flooding.
.2.2 Flooding in ... .
.3 Is danger imminent ?
.3.1 No, danger not imminent.
.3.2 Yes, danger of
~ heavy listing (to port / starboard)
~ decreasing stability.
~ damage by sea.
~ breaking apart.
~ environmental pollution.
~ ... .
.4 What is nature of sea bottom ?
.4.1 Sea bottom rocky.
.4.2 Sea bottom soft.
.5 What is state of tide ?
.5.1 No tide.
.5.2 Tide ... metres / rising / falling / turning at ... UTC / within ... hours.
.6 What is wind force and direction ?
.6.1 Wind force Beaufort... from ...*(s cardinal points)* .
.6.1.1 Wind expected to decrease / increase (within the next ... hours).
.6.1.2 Wind expected to back / veer (within the next ... hours).
.6.1. No change expected (within the next ... hours).
.7 What is sea state ?
.7.1 Sea smooth/moderate/rough/high / swell slight/moderate/heavy... metres from ...*(cardinal points)* .

.7.2 Sea smooth/moderate/rough/high / swell slight/moderate/heavy ... expected to decrease / increase (within the next ... hours).
.7.3 No change expected (within the next ... hours).
.8 What is draft ?
.8.1 Draft ... metres (port side / starboard side) forward / aft / amidships.
.9 What is depth of water ?
.9.1 Greatest depth ... metres (port side / starboard side) forward / aft / amidships.

B2/5.3 Orders for refloating

.1 Are (bilge) pumps operational ?
.1.1 Yes, (bilge) pumps operational.
.1.2 No, (bilge) pumps not operational (yet).
.1.3 (Bilge) pumps will be operational in ... minutes.
.2 Is damage control material available ?
.2.1 Yes, damage control material available.
.2.2 No, damage control material not available (yet).
.2.3 Damage control material will be available in ... minutes.
.3 Stand by engine room and report.
.3.1 Engine room standing by.
.4 Stand by all anchors for letting go.
.5 Report distribution of cargo.
.5.1 No. ... hold(s) / tank(s) ... tonnes (of ... cargo).
.5.2 Deck cargo foreward / aft / amidships ... tonnes (of ...).
.5.3 Forepeak / afterpeak ... tonnes.
.5.4 No. ... double bottom tank(s) ... tonnes (of ballast / ...).
.6 Transfer cargo from no. ... hold(s) / tank(s) to no. ...hold(s) / tank(s) and report.
.6.1 Cargo from no. ... hold(s) / tank(s) transferred to no. ... hold(s) / tank(s).
.7 Transfer deck cargo from ... to ... and report.
.7.1 Deck cargo from ... transferred to ... .
.8 Pump out forepeak / afterpeak and report.
.8.1 Forepeak / afterpeak pumped out.
.9 Transfer ballast / ... from no. ... double bottom tank(s) to no. ... double bottom tank(s) and report.
.9.1 Ballast / ... from no. ... double bottom tanks transferred to no. ... double bottom tank(s).
.10 Fill forepeak / afterpeak.
.11 Jettison cargo from ... and report.
.11.1 Cargo from ... jettisoned .
.12 Engine(s) full / ... astern / ahead.
.13 Has vessel refloated?
.13.1 Yes, vessel refloated.
.13.2 No, vessel not refloated (yet).

B2/5.4 Checking seaworthiness

.1 Request a (diving) survey.
.2 Report the result of the (diving) survey.
.2.1 No damage.
.2.2 Following damage to the plating:
.2.2.1 Crack(s) in area of ... .
.2.2.2 Deformation(s) / indentation(s) in area of ... .
.2.3 Following damage to the engine(s) / pipe(s):

.2.3.1 Crack(s) in the main engine(s) / auxiliary engine(s) foundation.
.2.3.2 Deformations / fracture(s) to the pipe(s) in / out ... .
.2.3.3 Fractures / bending of the bolt(s) of ...
.2.4 Following damage to the underwater hull:
(also see: .1.2.2)
.2.4.1 Deformation(s) / indentation(s) to the sea water inlet(s) / outlet(s).
.2.4.2 Deformation(s) / indentation(s) to the stem / bulb.
.2.4.3 Deformation(s) to the propeller(s).
.2.4.4 (Port / starboard) propeller(s) missing.
.2.4.5 Deformation to the rudder / to ... .
.2.5 Dry - docking is recommended / necessary.
.3 Is the vessel seaworthy ?
.3.1 Yes, the vessel is seaworthy ?
.3.2 No, the vessel is not seaworthy (yet).
.3.2.1 The vessel must be repaired and re-inspected.
.3.3 Request ... tug(s).

B2/6 Search and Rescue On-board Activities
For details also see IAMSAR-Manual, London/Montreal, 1998.

B2/6.1 Checking equipment status

.1 Check the lifebuoys and report.
.1.1 All lifebuoys are complete.
.1.2 Lifebuoy(s) at ... is / are damaged / missing.
.1.2.1 Replace the damaged / missing lifebuoy(s).
.2 When was the last man overboard drill ?
.2.1 Last man overboard drill was on ...*(date)* .
.3 Prepare a plan for man overboard drill.
.3.1 Prepare a plan for
~ an announced / not announced drill.
~ a daytime / nighttime drill.
~ a muster (at all stations).
~ a recovering manoeuvre (with dummy / buoy).
.4 Have a drill / manoeuvre / muster on ...*(date)* .

B2/6.2 Person-overboard activities

.1 Man overboard (on port side / starboard side / astern)!
.2 Drop lifebuoy(s).
.2.1 Sound "man overboard" alarm.
.3 Hoist flag signal "Oscar".
.4 Hard-a-port / hard-a-starboard the wheel.
.5 Is person in water / lifebuoy located ?
.5.1 Yes, person in water / lifebuoy located.
.5.2 Report direction and distance of person in water / lifebuoy.
.5.2.1 Direction at ... points port side / starboard side / ... degrees, distance ... metres.
.5.2.2 Maintain visual contact to person in water / lifebuoy.
.5.3 No, person in water / lifebuoy not located (yet).
.5.3.1 Look out for person in water / lifebuoy and report.
.5.4 Passenger / crew member missing (for ... hours / since ... UTC)
- search in vessel negative.
.5.4.1 Stop engine(s).

.5.4.2 Transmit alarm signal - PAN-PAN / distress alert - MAYDAY to radio coast station / Maritime Rescue Co-ordination Centre / vessels in vicinity and report.
.5.4.3 Alarm signal - PAN-PAN / distress alert - MAYDAY transmitted / acknowledged by ... / not acknowledged (yet)..
.6 Return manoeuvre ! Port / starboard, steer... degrees.
.7 Report position.
.7.1 Position ... .
.8 Report traffic situation.
.8.1 No vessel in vicinity.
.8.2 Following vessel(s) in vicinity ... .
.9 Report weather situation.
.9.1 Sea smooth/moderate/rough/high – swell slight/moderate/heavy from .. (cardinal points).
.9.2 Winds force Beaufort... from ... (cardinal points).
.9.3 Visibility good/moderate/poor.
.9.4 Current ... knots to ... (cardinal points).
.10 Have man overboard stations / lookouts at ... manned and report.
.10.1 Man overboard stations / lookouts at ... manned.
.11 Stand by for recovering from shipboard and report.
.11.1 Standing by for recovering from shipboard.
.12 Stand by boat / motor lifeboat no. ... for letting go and report.
.12.1 Rescue boat / motor lifeboat no. ... standing by for letting go.
.13 Let go rescue boat / motor lifeboat.
.14 Use VHF Channel ... / frequency ... for communication.
.14.1 Use light signals / flag signals / whistle for communication.
.15 What is retreat signal for rescue boat / motor lifeboat ?
.15.1 Retreat signal ... .
.16 Stand by one / two crew member(s) for rescue in water and report.
.16.1 One / two crew member(s) standing by for rescue in water.
.17 Person overboard rescued / recovered
.18 Stand by boat / rescue litter / rescue net / rescue basket / rescue sling and report.
.18.1 Boat / rescue litter / rescue net / rescue basket / rescue sling standing by.
.19 Hoist person and report.
.20 Report condition of survivor.
.20.1 Survivor
~ is in good / bad condition.
~ has hypothermia.
~ is injured.
~ is suffering a shock.
.20.2 Person is dead.

B2/6.3 Rescue operation - reporting readiness for assistance
Also see AI/1.2 "Search and rescue communications"

.1 Received an alarm signal / EPIRB transmission / PAN-PAN / distress alert - MAYDAY at ... UTC on ... *(VHF Channel/frequency)*.
.2 Observed the following distress signal in ... degrees.
.3 Report the distress position.
.3.1 Distress position ... .
.4 Was the alarm signal / EPIRB transmission / PAN-PAN / distress alert - MAYDAY acknowledged?

.4.1 The alarm signal / EPIRB transmission / PAN-PAN / distress alert - MAYDAY was acknowledged by ... / not acknowledged (yet)..
.4.2.1 Acknowledge the PAN-PAN / distress alert - MAYDAY - RELAY.
.4.3 Transmit a MAYDAY - RELAY to ... *(radio station)*.
.5 Watch the radar.
.6 Have the lookouts manned and report.
.6.1 Lookouts are manned.
.7 Contact vessels in vicinity of the distress and report.
.7.1 We have contact to following vessel(s) in vicinity of the distress: .... .
.7.2 We have no contact (yet).
.8 Request information from the vessel in distress and report.
.8.1 We have following information from the vessel in distress: ... .
.8.2 We have no information (yet).
.9 Stand by lines / lifebuoys / nets / derricks / cranes / ... and report.
.9.1 Lines / lifeboats / nets / derricks / cranes / ... standing by.
.10 Stand by lifeboats / rescue boat and report.
.10.1 Lifeboats / rescue boat standing by.
.11 Stand by liferaft(s) as boarding station(s) and report.
.11.1 Liferaft(s) standing by as boarding station(s).
.12 Let go liferaft(s) as boarding station(s) with ... crew members (each).
.13 Stand by ... crew members for assisting survivors in water and report.
.13.1 ... crew members standing by for assisting survivors in water.
.14 Switch on the deck lighting / outboard lighting / search lights.
.15 Stand by line throwing apparatus and report.
.15.1 Line throwing apparatus standing by.

B2/6.4 Conducting search

.1 We / MV ... will act as On-scene Co-ordinator.
.1.2 Inform radio coast station(s) / MRCC/ vessels in vicinity.
.2 Stand by bridge team / lookouts for information / signals of On-scene Co-ordinator.
.2.1 Following information / signal received from On-scene Co-ordinator:
.3 We carry out search pattern ... / radar search.
.3.1 We start search pattern ... radar search at ... UTC.
.3.1.1 Inform the crew / lookouts / engine room.
.4 Bridge team / lookouts !
Keep sharp lookout for signals / sightings of the vessel in distress and report every ... minutes.
.4.1 Light signals / smoke signals / sound signals / ... signals in ... degrees.
.4.2 Objects / vessel in distress / lifeboat(s) / life raft(s) / person(s) in water in ... degrees
.5 Stand by rescue team / boat crews / engine room and report.
.5.1 Rescue team / boat crews / engine room standing by.
.6 Transmit the following information / signals to the searching vessel(s): ... .

B2/6.5 Rescue activities
Also see B2/6.2 "Person-overboard activities"

.1 Rescue persons in following order:
- persons in water
- injured / helpless persons
- women and children

- passengers
- crewmembers.

.2 Ask the survivor(s) the following information:
.2.1 What was the total number of persons on board the vessel in distress ?
.2.1.1 Total number of persons was: ... .
.2.2 What was the number of casualties ?
.2.2.1 Number of casualties was: ... .
.2.3 What was the number of lifeboats / liferafts launched ?
.2.3.1 Number of lifeboats / liferafts launched was: ... .
.2.4 What was the number of persons in lifeboats / liferafts ?
.2.4.1 Number of persons in lifeboats / liferafts was: ... .
.2.5 What was the number of persons in water ?
.2.5.1 Number of persons in water was: ... .
.3 Inform ... coast radio station about the name(s) / call sign(s) and destination of the vessel(s) with the survivors.
.3.1 Inform about the number of survivors on (each) vessel.
.3.2 Inform about the condition of the survivors.
.4 Inform ... coast radio station about the condition of the vessel in distress:
.4.1 The vessel in distress
~ capsized / sunk / adrift (near position ...) / drifting in ... degrees.
~ grounded (in position: ...).
~ on fire.
~ not under command.
.5 Transmit the following safety message / navigational warning:
Vessel in distress (in position ...) danger to navigation.

B2/6.6 Finishing with search and rescue operations

.1 Search and rescue finished at ... UTC.
.1.1 Inform the crew / lookouts / engine room.
.2 We resume on-board routine at ... UTC.
.3 Inform the coast radio station / searching vessels about the cancellation of search and rescue.
.4 We proceed with our voyage.

B3 Cargo and Cargo Handling

B3/1 Cargo Handling

B3/1.1 Loading and unloading

.1 **Loading capacities and quantities**

.1 What is the deadweight of the vessel?
.1.1 The deadweight is ... tonnes.
.2 What is the hold / bale / grain capacity of vessel?
.2.1 The hold / bale / grain capacity is ... cubic metres.
.3 What is the container capacity of the vessel?
.3.1 The container capacity is ... TEU.
.4 How many 20'/ 40' containers will the vessel load?
.4.1 The vessel will load ... 20'/ 40' containers.
.5 How many cubic metres of cargo space are required?
.5.1 ... cubic metres of cargo space are required.

.6 How many tonnes / cubic metres can the vessel still load?
.6.1 The vessel can still load ... tonnes / cubic metres.
.7 How much deck cargo can the vessel load?
.7.1 The vessel can load ... tonnes / cubic metres / ... 20'/40' containers on deck.
.8 How many cars / trailers / trucks / ... can the vessel load?
.8.1 The vessel can load ... cars / trailers / trucks / ... .
.9 What is the size of the hatch openings?
.9.1 The size of the hatch openings is ... by ... metres.
.10 What is the safety load of no. ... hold?
.10.1 The safety load of the ... deck of no. ... hold is ... tonnes per square metre.
.11 The vessel will still bunker ... tonnes of fuel / fresh water/ ... .

.2 **Dockside / shipboard cargo handling gear and equipment**

.1 Are dockside / floating cranes available?
.1.1 Yes, dockside / floating cranes are available.
.1.2 No, dockside / floating cranes are not available.
.2 What is the capacity of the crane?
.2.1 The capacity of the crane is ... tonnes.
.3 What is the maximum reach of the crane?
.3.1 The maximum reach of the crane is ... metres.
.4 What is the handling capacity of the container crane / bridge?
.4.1 The handling capacity of container crane / bridge is ... containers per hour.
.5 What is the handling capacity of the grain elevator/ore loader/ ... ?
.5.1 The handling capacity of the grain elevator / ore loader / is ... tonnes / cubic metres per hour.
.6 What is the pumping capacity of the cargo pumps?
.6.1 The pumping capacity of the cargo pumps is ... tonnes per hour.
.7 Are (light) fork-lift trucks for the cargo holds available?
.7.1 Yes, (light) fork-lift trucks are available.
.7.2 No, (light) fork-lift trucks are not available.
.8 Only use electric fork-lift trucks in the holds.
.9 What is the capacity of the fork-lift truck?
.9.1 The capacity of the fork-lift truck is ... tonnes.
.10 What is the capacity of the derricks / cranes of the vessel?
.10.1 The capacity of the derricks / cranes of the vessel is ... tonnes.
.11 What is the capacity of the ... slings?
.11.1 The capacity of the ... slings is ... tonnes.
.12 These slings do not permit safe cargo handling.
.12.1 Replace the slings.
.13 Are bob-cats available for trimming?
.13.1 Yes, bob-cats are available for trimming.
.13.2 No, bob-cats are not available for trimming.

.3 **Preparing for loading / unloading**

.1 Prepare the vessel for loading / unloading.
.2 Unlock the hatch covers.
.3 Rig the hatchrails in no. ... hold(s).
.4 Give notice of readiness to load/unload by ... UTC/local time.
.5 Is the cargo list available and complete?
.5.1 Yes, the cargo list is available and complete .
.5.2 No, the cargo list is not available and complete (yet).

.5.3 The cargo list will be available and complete in ... minutes.
.6 Complete the stowage plan.
.7 Make the stability calculation.
.8 Are the holds clean / dry / free of smell ?
.8.1 Yes, the holds are clean / dry / free of smell.
.8.2 No, the holds are not clean / dry / free of smell (yet).
.8.3 The holds will be clean / dry / free of smell in ... minutes / hours.
.8.3.1 Clean the hold(s) / deck(s).
.9 Are the safety arrangements in the hold(s) operational?
.9.1 Yes, the safety arrangements in the hold(s) are operational.
.9.2 No, the safety arrangements in the hold(s) are not operational (yet).
.9.3 The safety arrangements in the hold(s) will be operational in ... minutes.
.10 Fill the double bottom tank(s) / ballast tank(s) before loading the heavy lifts.
.11 What is the maximum loading rate / unloading rate?
.11.1 The maximum loading rate / unloading rate is ... tonnes per hour.
.11.2 Do not exceed the loading rate / unloading rate of ... tonnes per hour.

.4 **Operating cargo handling equipment and hatches**

.1 Open all hatches before loading / unloading.
.2 Are the cranes / derricks operational?
.2.1 Yes, the cranes / derricks are operational.
.2.2 No, the cranes / derricks are not operational (yet).
.2.3 The cranes / derricks will be operational in ... minutes.
.3 Rig the derrick(s) / crane(s) of no. ... hold(s).
.4 Check the preventers.
.5 Keep the safe working load of derrick(s) / crane(s).
.6 Instruct the winchmen / cranemen .
.7 Clean the tween deck(s) before opening lower hold(s).
.8 Switch on / off the hold ventilation.
.9 Switch on / off the hold lights.
.10 Close / open the cargo port(s) to no. ... hold(s).

.5 **Maintaining / repairing cargo handling equipment**

.1 Check the hold(s) / hatch cover(s) / derrick(s) / ... for damage and report.
.1.1 The hold(s) / hatch cover(s) / derrick(s) / ... is / are in order.
.1.2 The cargo battens are damaged.
.1.3 The rubber seals of the hatch cover(s) are damaged.
.1.4 The preventer(s) of no. ... hold(s) is / are damaged.
.1.5 The (Container) lashings are damaged.
.1.6 ... is / are damaged.
.1.6.1 Replace the damaged ... .
.2 The hold ladder(s) is / are bent.
.2.1 Straighten the hold ladder(s).
.3 Are the hold ventilators operational?
.3.1 Yes, the hold ventilators are operational.
.3.2 No, the hold ventilators are not operational (yet).
.3.3 The hold ventilators will be operational in ... minutes.
.4 Are the winch motors operational?
.4.1 Yes, the winch motors are operational.
.4.2 No, the winch motor of no. ... derrick is not operational (yet).
.4.3 The winch motor of no. ... derrick will be operational in ... minutes.
.5 Check the repair works personally.

.6 **Briefing on stowing and securing**

.1 Check the
~ careful and safe stowage.
~ complete unloading.
~ proper use of handling gear.
~ careful separation of different lots.
.2 Close the hatches in case of rain / snow / ... .
.3 Refuse damaged / crushed / renailed /wet /torn/ resewn / ... boxes / cartons / cases /crates / bags / ... .
.4 Do not overstow cartons with other goods ... .
.5 Do not use hooks for handling bags.
.6 Stow ventilation ducts into the bag cargo.
.7 Place dunnage between the tiers.
.8 Stow the

~ ... into tween deck of no. ... hold.
~ pallets / cartons / ... closely together.
~ ... in reefer hold.
~ empty containers in topmost tiers .
~ container(s) onto hatch cover(s).
~ ... .

.9 Check the
~ containers for damage.
~ correct interlock of the stowpieces.
~ correct fixing of the rope clips.
~ ... .

.10 Secure the heavy lift(s) immediately .

.11 Relash all lashings.

B3/1.2 Handling dangerous goods

Also see IMO-IMDG Code, London 1994, as revised.

.1 **Briefing on nature of dangerous goods**

.1 What is the IMO-Class of these goods?
.1.1 The IMO-Class of these goods is: ... .
.2 This package contains IMO - Class ... goods.
.3 These goods are flammable / poisonous / ... .
.3.1 Handle these goods with caution.
.4 These goods emit flammable gases in contact with water.
.4.1 Keep these goods dry.
.5 These goods are liable to spontaneous heating and combustion.
.6 Do not touch ... .

.2 **Instructions on compatibility and stowage**

.1 Observe the IMDG-Code when loading / stowing.
.2 Check the
~ proper segregation of goods.
~ correct technical names in documents.
~ correct marks / labels.
~ compatibility of IMO-Class ... goods.
.3 Stow IMO-Class ... goods
~ away from living quarters / away from ... .
~ separated (by one hold) from IMO-Class ... goods.
~ under / on deck.
.3.1 Cover IMO-Class ... goods on deck with tarpaulins / ... .
.4 Stow
~ flammable goods away from the engine room bulkhead / ... .
~ infectious substances separated by one hold / compartment from foodstuffs.
~ ... drums away from IMO-Class ... goods at a minimum of ... metres.
.5 Brief the stevedores on the dangerous goods in number ... hold(s).
.6 Refuse damaged / wet / ... packings with dangerous goods.
.7 Ventilate the hold(s) before entering.
.8 Load / unload IMO-Class ... goods first.
.9 No smoking during loading / unloading.

.3 **Reporting incidents**

.1 Sling(s) with bottles / drums / ... of IMO-Class ... goods were dropped on deck / into no. ... hold / on pier ... .
.1.1 Liquid / powder / gas is spilling.
.2 Several drums / barrels / tanks / ... are deformed (and leaking).
.3 The ... container with IMO-Class ... goods is spilling out of the door.
.4 Spilling substances of IMO - Class ... escaped into the sea / harbour water
.4.1 Inform the pollution control.
.5 Temperature in locker / container/ ... with IMO-Class ... goods is increasing (rapidly).
.6 Orange / red / ... smoke is developing from IMO-Class ... goods (on deck).
.7 Explosion in no. ... hold.
.7.1 Damage to gas tank / container /....
.8 Minor / major fire in number ... hold.
.8.1 Fire extinguished.
.8.2 IMO-Class ... goods re-ignited.
.8.3 Fire under control.
.8.4 Fire not under control (yet).
.8.4.1 Operate the general emergency alarm.
.8.4.2 Alarm the harbour fire brigade / ... .
.9 Report injured persons / casualties.
.9.1 No person injured.
.9.2 Number of injured persons / casualties is ... .

.4 **Action in case of incidents**

.1 Take actions according to the Emergency Plan.
.2 Turn the vessel out of the wind – the spilling gas / smoke is toxic.
.3 Put on protective clothing and breathing apparatus.
.4 Stop the spillage.
.5 Let the spillage evaporate.
.6 Remove the spillage with synthetic scoops.
.6.1 Use absorbents for the spillage.
.6.2 Do not touch the spillage.
.7 Separate contaminated goods from other goods.
.8 Cover contaminated goods with tarpaulins / ... .
.9 Only open the container / hold / locker / ... when smoking is stopped.
.10 Cool down the container/ ... with water.
.11 Ventilate the hold(s) carefully.
.12 Close the hatch - operate the fire extinguishing system.
.13 Fight the fire from a great distance.
.14 Flood no. .. hold(s).
.15 Rescue persons.
.15.1 Take injured persons / casualties to a safe area.
.15.2 Provide first aid to injured persons / casualties.
.15.3 Call the ambulance.
.16 Take off and dispose contaminated clothing.
.17 Alter course for the nearest port (- inform on radio).

B3/1.3 Handling liquid goods, bunkers and ballast - pollution prevention

.1 **Preparing safety measures**

.1 Plug the scuppers / drip-trays and report.
.1.1 All scuppers / drip-trays are plugged.
.2 Close the sea-valves / discharges and report.
.2.1 All sea-valves / discharges are closed.
.3 Stand by absorbent materials and report.
.3.1 Absorbent materials standing by.
.4 Stand by spill control gear and report.
.4.1 Spill control gear standing by.
.5 Stand by emergency fire pump / foam monitor / fire extinguishers and report.
.5.1 Emergency fire pump / foam monitor / fire extinguishers standing by.
.6 Fit bonding wire and report.
.6.1 Bonding wire is fitted.
.7 Maintain contact on VHF Channels ... with the bunker barge / oil terminal.
.8 Is the oil pollution prevention plan available ?
.8.1 Yes, the oil pollution prevention plan is available.
.8.2 No, the oil pollution prevention plan is not available (yet).
.8.3 The oil pollution prevention plan will be available in ... minutes.
.9 Instruct the pumpman / ... and report.
.9.1 Pumpman / ... is instructed.

.2 **Operating pumping equipment**
including: phrases for communication with bunker barge / oil terminal

.1 What is the (maximum) loading rate / discharge rate ?
.1.1 The (Maximum) loading rate / discharge rate is: ... tonnes per hour.
.2 Is the COW - system / inert gas system operational ?
.2.1 Yes, the COW - system / inert gas system is operational .
.2.2 No, the COW - system / inert gas system is not operational (yet).
.2.3 The COW - system / inert gas will be operational in ... minutes.
.3 When will crude oil washing start ?
.3.1 Crude oil washing will start in ... minutes.
.4 Are your tanks inerted?
.4.1 Yes, my tanks are inerted.
.4.2 No, my tanks are not inerted (yet).
.4.3 My tanks will be inerted in ... minutes.
.5 What is the pressure in the inerted tanks?
.5.1 The pressure in the inerted tanks is ... bar.
.6 What is the pumping pressure ?
.6.1 The pumping pressure is ... bar.
.7 Can we connect the loading arm ?
.7.1 Yes, you can connect the loading arm.
.7.2 No, you cannot connect the loading arm (yet).
.7.3 Connect the loading arm in ... minutes.
.8 Inform ... minutes before loading / discharge will start / finish.
.8.1 Loading / discharge will start / finish in ... minutes.
.9 What is the back pressure for stripping ?
.9.1 The backpressure for stripping is... bars.

.10 Are the cargo hoses / booms connected ?
.10.1 Yes, the cargo hoses / booms are connected.
.10.2 No, the cargo hoses / booms are not connected (yet).
.10.3 The cargo hoses / booms will be connected in ... minutes.
.11 Are the cargo hoses / booms disconnected ?
.11.1 Yes, the cargo hoses / booms are disconnected.
.11.2 No, the cargo hoses / booms are not disconnected (yet).
.11.3 The cargo hoses / booms will be disconnected in ... minutes.
.12 Are you ready to load /discharge?
.12.1 Yes, I am ready to load / discharge.
.12.2 No, I am not ready to load /discharge (yet).
.12.3 I will be ready to load / discharge in ... minutes.
.13 Keep a safe working pressure.
.14 Open the valve(s) and report.
.14.1 All full open aboard / ashore.
.15 Close the valve(s) and report.
.15.1 All full closed aboard / ashore.
.16 Start pumping (slowly).
.17 Are you pumping / receiving ?
.17.1 Yes, I am pumping / receiving.
.17.2 No, I am not pumping / not receiving.
.18 Increase / decrease pumping rate to ... revolutions / bar..
.19 (Quantity received) - stop pumping.

.3 **Reporting and cleaning up spillage**

.1 Leak at manifold connection!
.1.1 Overflow at ... !
.2 Stop pumping !
.3 How much is spilled ?
.3.1 Spill is about ... tonne(s).
.4 Treat spill with ... .
.5 Stand by oil clearance team and report.
.5.1 Oil clearance team standing by.
.5.2 All crew assist to remove the spill.
.5.4.1 Spillage stopped.
.5.4.2 Spill cleaned up.
.5.4.3 Spill waste contained in save-all/… .
.6 Oil / ... escaping into sea / harbour water!
.6.1 Inform pollution control!

.4 **Ballast handling**

.1 Plug the scuppers and report.
.1.1 All scuppers are plugged.
.2 Open / close the sea suction valve / ballast tank valve no. ... and report.
.2.1 Sea suction valve / ballast tank valve no. ... is open / closed.
.3 Start the ballast pump and report.
.3.1 Ballast pump started.
.4 Stop the ballast pump (- ballast overflow!) and report.
.4.1 Ballast pump stopped.

.5 Pump out ballast tank no. ... and report.
.5.1 Ballast tank no. ... is pumped out.
.5.2 Stop the ballast pump - ballast dirty !

.5 **Cleaning tanks**

.1 Pump the slops into the slop tank .
.2 Dispose the sludge into the sludge tank.
.3 Order a shore slop tank / slop barge.
.3.1 We have ... tonnes of slops / sludge.
.4 Start / stop pumping slops.
.5 Keep a safe working pressure.

B3/1.4 Preparing for sea

.1 Close and secure the hatch covers for sea and report
.1.1 Hatch covers closed and secured.
.2 Lash and secure the goods for sea and report.
.2.1 Goods lashed and secured.

(In ro/ro-ferries: The execution of the instructions 3,4 and 5 given from the bridge on radio should be confirmed from the person in charge of the corresponding station using phrases 3.1, 4.1 and 5.1)

.3 Close and secure the bow door / stern door and report..
.3.1 Bow door / stern door closed and secured.
.4 Fold and secure the bow ramp / stern ramp / side ramp and report.
.4.1 Bow ramp / stern ramp / side ramp folded and secured.
.5 Lash and secure all cars / trucks / wagons / ... and report.
.5.1 All cars / trucks / wagons / ... lashed and secured.
.6 Lower and secure the derricks / cranes and report.
.6.1 Derricks / cranes lowered and secured.
.7 Check the seaworthiness of the holds and report
.7.1 Holds seaworthy.
.8 How much ballast can we take (down to her marks)?
.8.1 We can take ... tonnes of ballast.
.9 Check the trim.
.9.1 Fill the forepeak to decrease the stern trim.
.9.2 Fill the double-bottom tank(s) .
.9.3 Pump fuel from ... tank to ... tank to bring the vessel upright.

B3/2 Cargo Care

B3/2.1 Operating shipboard equipment for cargo care

.1 Is the equipment for cargo care operational?
.1.1 Yes, the equipment for cargo care is operational.
.1.2 No, the ... *(equipment*) is not operational (yet).
.1.3 The ... *(equipment)* will be operational in ... minutes.
.2 What is the air change rate of the hold ventilators?
.2.1 The air change rate of the hold ventilators is ... -fold.

.3 Are the temperature / humidity recorders in the hold(s) operational?
.3.1 Yes, the temperature / humidity recorders in the hold(s) are operational.
.3.2 No, the temperature / humidity recorders in the hold(s) are not operational (yet).
.3.3 The temperature / humidity recorders in the hold(s) will be operational in ... minutes.
.4 Instruct the crew how to connect reefer plugs / clip-on units / ... and report.
.4.1 The crew is instructed how to connect reefer plugs / clip-on units / ... .

B3/2.2 Taking measures for cargo care

.1 **Carrying out inspections**

.1 The holds must be inspected by the surveyor before loading.
.2 Check the reefer holds for proper loading preparation and report.
.2.1 The reefer holds are ready for loading.
.2.2 The reefer holds are not ready for loading (yet).
.2.3 The reefer holds will be ready for loading in ... minutes.
.3 Are the holds clean (dry and free of smell)?
.3.1 Yes, the holds are clean(dry and free of smell).
.3.2 No, the holdsare not clean (dry and free of smell) (yet).
.3.3 The holds will be clean (dry and free of smell) in ... minutes / hours.
.4 Check the operation of the hold ventilators and report
.4.1 The hold ventilators are operational.
.4.2 The hold ventilators (in no. ... hold(s)) are not operational (yet).
.4.3 The hold ventilators (in no ... hold(s)) will be operational in ... minutes.
.5 Order a surveyor to check the reefer plugs / cargo securings.
.6 Is the certificate of survey available and complete?
.6.1 Yes, the certificate of survey is available and complete.
.6.2 No, the certificate of survey is not available and complete (yet).
.6.3 The certificate of survey will be available and complete in ... minutes / hours.
.7 Check the lashings and securings every day / ... hours..
.8 Enter all checks into the log - book.
.9 Before unloading open the hatches only when the surveyor is present.

.2 **Describing damage to the cargo**
Also see section B2/1.2.3 "Reporting incidents"

.1 The ...*(cargo*) is in a bad condition.
.2 The packages of ...*(cargo)* are
~ wet / damp / mouldy.
~ marked by fresh water / sea water.
.3 The metal of ...*(cargo)* is rusty.
.4 The bands of ...*(cargo)* are broken / missing / rusty.
.5 The crates / cases with ...*(cargo)* are renailed.
.5.1 The boards of crates/cases with ...*(cargo)* are loose.
.6 The marks / labels on ...*(cargo)* are unclear / illegible /false.
.7 The contents of drums / barrels / ... are unknown.
.8 The weight of the ...*(cargo)* is unknown.
.10 The boxes / crates / cases / ... with ...*(cargo)* are damaged.
.11 The bags / bales with ...*(cargo)* are torn / resewn / spilling.
.12 The drums / barrels / ... with ...*(cargo)* are deformed / spilling .
.13 The boxes / cartons / cases/ ... with ...*(cargo)* are crushed.
.14 The bags / boxes / cartons / ... with ...*(cargo)* are not full / slack / empty.

.15 The bags / boxes / cartons / ... with ...*(cargo)* are second hand.
.16 The boxes/cartons/cases/ ... with bottles of ...*(cargo)* are (partly) broken.
.17 The ...*(cargo*) is (partly)
~ eaten by rats /worms.
~ infected by vermin.
~ missing.
.18 ... container(s) are damaged.
.18.1 ... container(s) were damaged
~ before loading.
~ during loading.
~ by shifting on board.
~ by heavy seas.
.19 ... container(s) were washed overboard (- inform on radio).
.20 The temperature in no. ... hold is
above normal / below normal / critical / ... degrees Celsius.
.21 The humidity of ...*(cargo)* is above normal / below normal / critical.

.3 **Taking actions**
Also see section B2/1.2.4 "Action in case of incident"

.1 Switch on the hold ventilation to supply / exhaust air.
.2 Switch off the hold ventilation (in case of shipping seas).
.3 Switch on / off the automatic temperature control / recorder.
.4 Relash the container(s) /car(s) / trucks(s)... in no. ... hold / on ... deck.
.5 Replug the reefer container(s) in no. ... hold/on deck.
.6 Secure the shifting cargo in no. ... hold / on ... deck.
.7 Protect the deck cargo of ...*(cargo)* against sun / rain / shipping seas.
.8 Keep the deck cargo of ...*(cargo)* wet / dry.
.9 Check the contents of drum(s) / barrel(s) /container(s) / ... with false labels.

B4 Passenger Care

The phrases of this chapter should help Masters, officers and crew members of passenger vessels and passenger ferries to inform passengers on safety aspects and to manage them in case of an emergency.

B4/1 Briefing and Instruction

B4/1.1 Conduct of passengers on board

.1 **General information on conduct of passengers**

.1 Ladies and Gentlemen. This is Captain ... speaking.
I have pleasure in informing you that all safety equipment is in full working order.
The bow / stern doors are closed and secured. The vessel is in all respects ready for sea.
Please listen carefully to the safety instructions which follow. In the unlikely event of an emergency, please obey the orders given on the public address system.
.2 Passengers are requested to read all notes and leaflets concerning safety regulations.
.3 All regulations concerning the vessel's routine have to be obeyed.

.2 **Briefing on prohibited areas, decks, and spaces**

Safety regulations do not permit passengers to enter the following spaces:
- navigating bridge
- engine room
- manoeuvring areas at the front and back end of the vessel
- cargo rooms and compartments
- service rooms
- all areas and spaces marked "Crew only"
- all closed, sealed or roped off areas, spaces and rooms
- car decks when the vessel is at sea.

B4/1.2 Briefing on safety regulations, preventive measures and communications

.1 **Drills**

.1 International regulations require all passengers to be assembled in a drill which has to take place within 24 hours of departure..
.2 A drill will be held to familiarize passengers with their assembly stations, with their life-saving equipment and with emergency procedures.
.3 All passengers must attend this drill.

.2 **The general emergency alarm**

.1 In case of emergency seven short blasts and one prolonged blast will be given with the ship's whistle and the alarm system.
.2 Remain calm when you hear the general emergency alarm.
.3 Passengers will be taught how to act and behave in cases of emergency .

.3 **Preventing / reporting fire**

. 1 Always remember that fire is the greatest hazard aboard ship.
. 2 Always act immediately if you detect fire, smell, fume or smoke.
. 3 Always inform a member of the crew if you detect fire, smell fume or smoke.
. 4 Be careful to extinguish cigarettes completely.
. 5 Put used cigarettes in a container provided.
. 6 Never smoke in bed.
. 7 Never smoke on deck except in areas labelled as smoking areas.
. 8 Never throw a cigarette overboard.
. 9 The use of naked light and open fire is strictly prohibited.
.10 Never use lighted candles.
.11 Never hang anything over or near an electric bulb.
.12 Never use an electric iron in a cabin. If you need to iron something use the ironing room on .... deck. The key may be collected at the information desk.
.13 If you detect a fire, smell, fume or smoke act immediately as follows:
- Call out "Fire !"
- Operate the nearest fire alarm
- Inform a member of the crew
  - Telephone the navigating bridge. The number to dial is ....
  -

.4 **PA announcements on emergency**

.1 Attention please! Attention please!
This is your captain with an important announcement.
I repeat, this is your captain with an important announcement.
.1.1 We have grounded/ a minor flooding (in ...)/ a minor fire (in ...).
.1.2 There is no immediate danger to our passengers or the ship
- and there is no reason to be alarmed.
.1.3 For safety reasons we request all passengers to go to their assembly stations on deck .. and wait there for further instructions.
.1.4 Please follow the instructions given by the officers and crew.
.1.5 The ship's fire fighting team / damage control team is fighting the fire / flooding.
.1.6 We also have radio contact with other ships / radio coast stations.
.1.7 The fire / flooding is under control.
.1.8 As soon as I have further information I will make another announcement.
I ask you kindly to remain calm. There is no danger at this time.
.2 This is your Captain speaking. I have another announcement.
The fire / flooding is not under control yet.
.2.1 There is smoke formation / flooding in ... - access to this area is prohibited..
.2.2 For safety reasons we request all passengers to prepare to go to their assembly stations. Access to the assembly stations will be via ..... . Do not forget to take your lifejackets and blankets with you.
.2.3 All passengers of deck no. ..... are requested to follow the crew members who will escort you to your assembly stations.
.2.4 When you get to your assembly stations put on your lifejackets and wait for further orders.
.2.5 Do not go to the lifeboat stations until you are ordered to do so.
.2.6 Go to your lifeboat stations.
.2.7 Follow the escape routes shown.
.2.8 Do not enter the lifeboats / liferafts. The order to enter the lifeboats / liferafts will be given from the bridge or by the officers.
.2.9 We have just received a message from shore / other vessels that assistance is on the way. Assistance should arrive within approximately .... hours.

.5 **Person overboard**

.1 If you see anybody fall overboard, act as follows:
- call out "Man overboard"
- throw lifebuoys overboard
- keep your eyes on the person in the water
- show / tell an officer / crew the person's position in the water, or telephone the bridge immediately, the number is .... .

.6 **Protective measures for children**

.1 Children must be kept under permanent observation.
.2 Never let children climb or sit on the ship's rails.
.3 Special lifejackets for children are available; please ask the steward / stewardess.
.4 You may leave your children under qualified care in the children's playroom / on the playdeck on .... deck from .... to .... hours.

B4/2 Evacuation and Boat Drill

B4/2.1 Allocating / directing to assembly stations, describing how to escape

.1 When the general emergency alarm is sounded which consists of seven short blasts and one prolonged blast, all passengers have to go to their assembly station. Take your lifejackets and blankets with you. Lifejackets are stored in your cabins under your beds and at your assembly stations. You are encouraged to try on your lifejacket.

.2 All passengers must put on
- warm clothing
- long trousers, long-sleeved shirts / jackets
- strong shoes and head covering.

.3 All passengers with their lifejackets and blankets are requested to go to their assembly stations/ the lounge / the ... immediately.

.4 From your assembly stations you will be escorted to your lifeboats / liferafts.

.5 All passengers are requested to carefully study the safety instructions behind their cabin doors.

.6 All passengers are requested to follow the escape routes shown.

.7 Do not use lifts / elevators.

.8 All passengers are requested to strictly obey the instructions given by the officers or crew.

.9 When you hear the abandon ship alarm which consists of one prolonged and one short blast repeated continuously, please act in the same manner as under the general emergency alarm.

.10 During the voyage you may hear some other sound signals. These are exclusively for the information of the crew.
Please, act only if you hear the general emergency alarm or the abandon ship alarm.

.11 If you have any questions regarding safety, do not hesitate to ask any of the officers or crew.

B4/2.2 Briefing on how to dress and what to take to assembly stations

.1 Take your lifejacket and a blanket.
You will find your lifejacket under your bed.

.2 Put on warm clothing, long-sleeved shirts, strong shoes and head covering whatever the weather. No high-heeled shoes.

.3 Do not forget personal documents, your spectacles and medicine if necessary.

.4 Do not return to your cabin to collect your property.

B4/2.3 Performing roll call

.1 At your assembly station one of the officers / crew will perform a roll call.

.2 The officer / crew will say "This is a roll call", and s/he will call out the passengers individually by their names.

.3 When your name is called out, please answer loudly "Here".

.4 If one of your cabinmates is not able to attend the roll call, please inform the officer/crew immediately.

B4/2.4 Briefing on how to put on lifejackets

.1 (*dependent on type of lifejacket used*)
- pull the lifejacket over your head
- tighten the strings well
- pull the strings around your waist and tie in front.

.2 Follow closely the demonstration given by the officer / crew.
The crew members will help you if necessary.

.3 Carefully study the demonstration in the pictures in your cabins.

.4 Carefully study the demonstration in the diagram at the assembly station.

B4/2.5 Instructions on how to embark and behave in lifeboats / liferafts

.1 Enter the lifeboat / liferaft only when ordered by an officer / lifeboatman.

.2 Clear the entrance of the lifeboat / liferaft immediately after entering.

.3 Do not push each other when entering the lifeboat / liferaft.

.4 Hold on to ropes or to your seat when lowering / hoisting.

.5 Sit down in the lifeboat / liferaft immediately.

.6 Keep your lifejackets on.

.7 Provisions and drinking water will be distributed by an officer / lifeboatman only.

.8 Strictly obey all instructions given by the officer / lifeboatman.

.9 Discipline in the lifeboat / liferaft is of vital importance.

B4/2.6 On-scene measures and actions in lifeboats / liferafts

.1 Keep a sharp lookout for persons in the water.

.2 Have a line / hook / knife / lifebuoy ready.

.3 Do not take off your shirts / long trousers / head covering whatever the weather.

.4 Pump out the water / free the lifeboat / liferaft from water.

.5 Who needs medical first aid?

.6 Everybody will get the same ration of provisions and water.

.7 Warning! Do not drink sea water whatever the situation.

.8 We will send a MAYDAY.

.9 We will fire rockets / use smoke buoys / ..... to attract attention.

.10 We will join the other lifeboats / liferafts.

B4/3 Attending to Passengers in an Emergency

B4/3.1 Informing on present situation

.1 The vessel was abandoned in position .... due to
fire / grounding / collision / flooding / heavy list / serious damage / ... .

.2 Keep calm. There is no reason to panic.
The officers / lifeboatmen know exactly what to do.

.3 There are enough life-saving appliances for everyone on board.

.4 The Maritime Rescue Co-ordination Centre/vessels in the vicinity have already been informed of our situation.

.5 Vessels / helicopters / airplanes are coming to our rescue.

.6 Vessels / helicopters / airplanes will reach us within ..... hours.

.7 We have radio contact with rescue craft.

.8 There are enough provisions and drinking water for 48 hours.

.9 You obtain medicine for seasickness from the lifeboatman.

B4/3.2 Escorting helpless passengers

.1 ..... persons are missing.
.2 Search all cabins / WC /s howers for missing persons.
.3 Assist those who need help.
.4 Help children, elderly, disabled, injured or sick persons with lifejackets.
.5 Give assistance when entering lifeboats / liferafts.
.6 We require warm clothing and blankets
for the children / elderly / disabled / injured / sick.
.7 We require a stretcher for the disabled / injured / sick.
.8 All persons, please move closer.
.8.1 The elderly / disabled / injured / sick need room to lie down.
.9 Everyone, please, be quiet. The children / the sick need rest.

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