

Aotearoa One

Competent Crew/Taurira Text Book



This Competent Crew/Tauira Book belongs to;

Tauira/Competent Crew Syllabus

The syllabus represents the knowledge required of a person wishing to qualify as an Tauira/Competent Crew. The tasks set in the task book are designed to ensure you cover the syllabus subjects, so it is important to complete them fully. The task book and syllabus can then be used as a revision guide.

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Seamanship

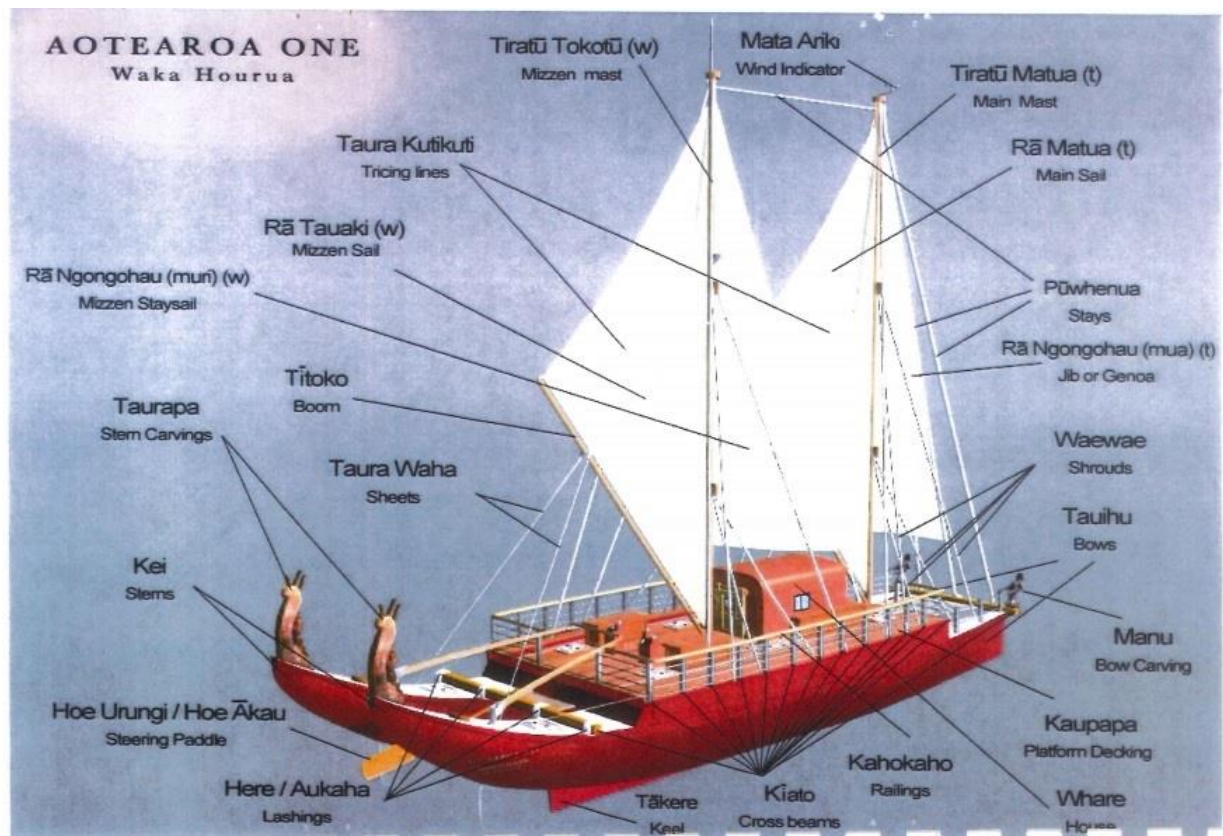
Vessel Parts and Fittings

It is important to be able to clearly describe a part of the ship or a piece of equipment on-board using the proper nautical terms. Using the right words improves communication on-board and allows mariners to relay information accurately and briefly, a particularly useful ability during emergencies. You must become comfortable and confident in the use of nautical terms and to help you, the following diagrams show how parts of a vessel are commonly described.

Anatomy of a Vessel

Vessels look completely different but there are some basic terms that are used to refer to parts and areas.

Hull



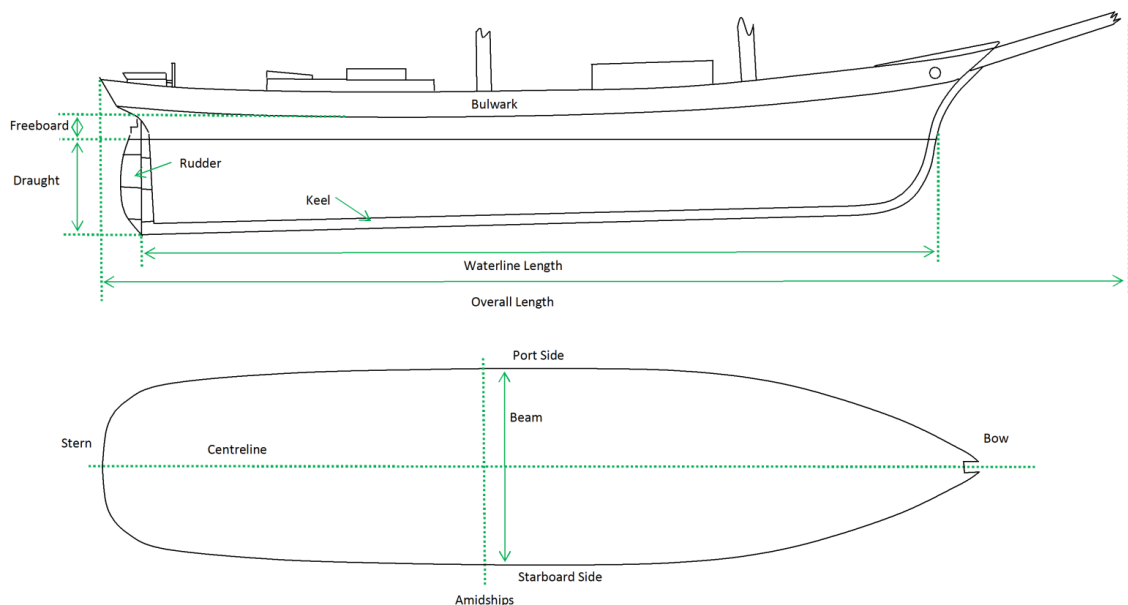
The Hulls are the watertight body of the vessel.

The four sides of a vessel are:

- Bow/Tauhu – the front of the vessel, this can also be referred to as the Stem which is the front edge of the bow.
- Stern/Kei – the back of the vessel.
- Port side/..... – the left hand side of the vessel.
- Starboard side/.....– the right hand side of the vessel.

Vessels are measured by the following terms:

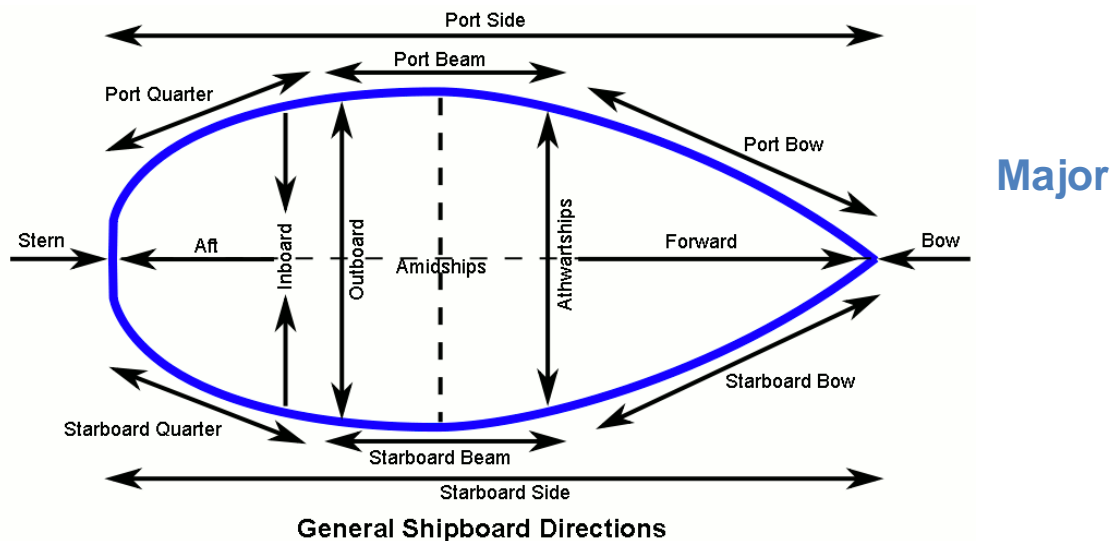
- Length – most common are “Waterline Length” referring to the length of the vessel at the waterline and “Overall Length” which is the length from both extremities.
- Beam – the width of the vessel hull at its widest point.
- Draught – the depth of the hull in the water
- Freeboard – the height of the deck above the water.
- Centreline – the fore and aft centreline of the vessel
- Amidship – the across vessel centreline.



Some other term's that are common:

- Deck – the top of the hull, everything above the deck is referred to as being On Deck or Above Deck and everything below is Below Deck. The underside of the deck is called the Deck Head.
- Superstructure – any structure build above the deck of the vessel.
- Bulkheads – the walls that you find below decks.
- Collision Bulkhead – the first bulkhead behind the bow, normally built stronger in case of damage to the bow in a collision.

- Keel – The fore-and-aft member that runs along the centre of the vessel at the very bottom and forms the backbone of the vessel on which the whole structure of a vessel is built
- Bulwarks – the sides of the vessel that rise above the deck.
- Bilge – the area inside the vessel, above the keel. Normally where bilge water collects.
- Tiller and Rudder /Hoe rua – used to control the direction of the vessel
-



Vessel Familiarisation

This form is designed as an aid for familiarising personnel with the safety features and procedures on board this vessel.

ALL new crew and those unfamiliar with the vessel should participate in the Safety Induction activity below.

This induction is to be conducted by the skipper of the vessel or authorised qualified person.

- Job duties explained (including safe work practices e.g., securing loose items, lookout duties, correct lifting of heavy weights etc)
- Workplace hazards and dangers (winches, chains, cables, hot surfaces, slippery surfaces etc)
- Life jacket (personal flotation devices) locations and donning demonstration
- Operation of ship's VHF/HF radio and communication equipment (including EPIRBs)
- Pyrotechnics (flares) and line throwing apparatus (description & instruction)
- Emergency fuel shutoffs, ventilation fire flaps and dampers (location & operation)
- Location of emergency torches

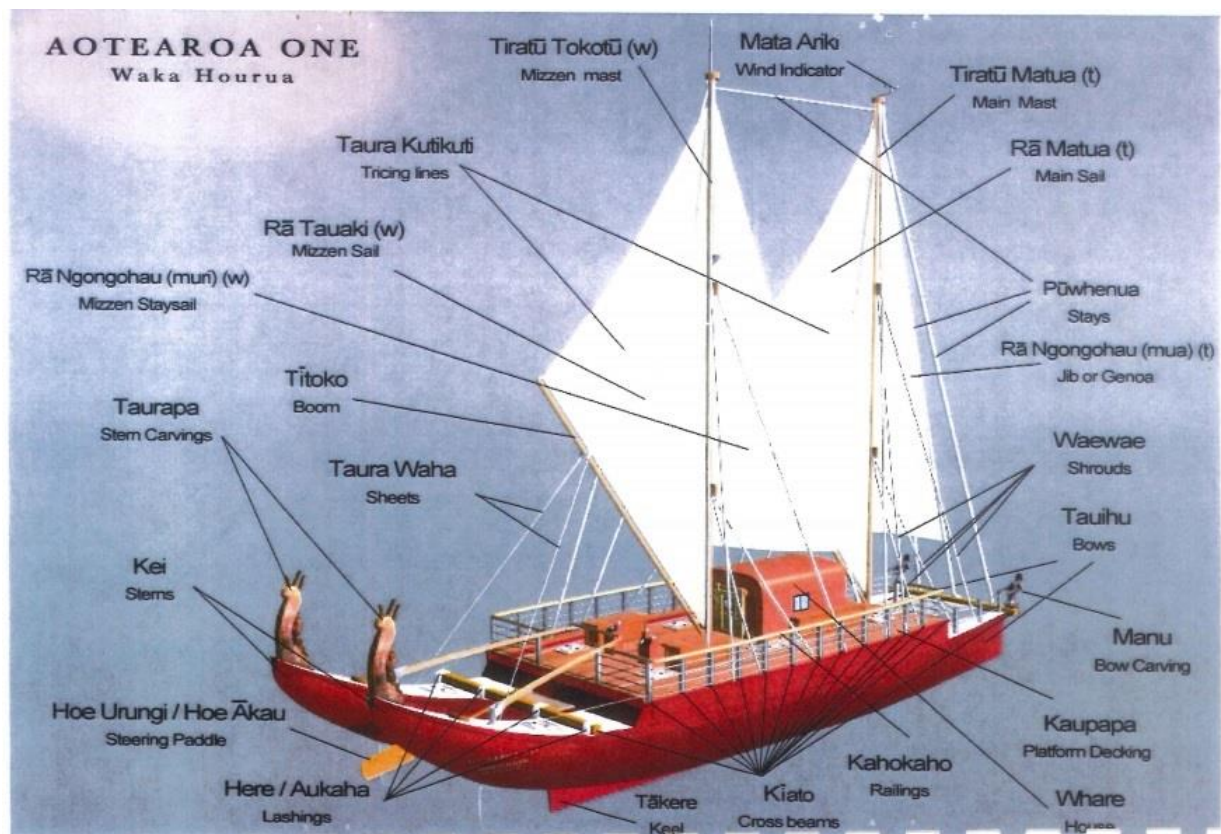
- Fire extinguishers (including types) and spaces served by smothering systems (location & operation)
- Basic fire fighting instruction
- Location of Medical Locker and/or First Aid kits
- Seasickness (precautions/remedies to take)
- Brief outline of emergency drills: (man overboard, accident casualty, watertight doors, fire, radio distress calls, vessel grounding, abandon vessel etc)
- Anchor deployment instruction
- Life raft and rescue boat locations (with launching instructions & procedures)
- Safety on deck at night
- Safety procedures in tenders or dinghy's
- Life buoy locations and use
- Operation of fire and/or emergency alarms
- Escape routes from accommodation
- Fire hydrants and hoses (location & operation)
- Location and operation of emergency fire pump
- Location and operation of emergency bilge pump
- Escape routes from machinery spaces
- Galley fan stops, gas isolator and fire blanket
- Location and use of personal protective equipment (ear defenders, safety glasses, safety helmet etc)
- Mooring Procedure
- Other safety equipment i.e. immersion suit, stretcher, personal EPIRB, safety harness etc.
- Location of Muster Area

Take Five

Your vessels MTOp and Vessel manual and company procedures will provide guidance on the management of hazards and you must familiarize yourself with this. Additionally to help manage hazards it is useful to employ a simple risk management tactic when undertaking tasks, particularly new tasks or ones only undertaken occasionally. This tactic consists of five steps:

1. Stop and look
2. Think through the task
3. Identify the risks/hazards
4. Control those risks or seek advice
5. Do the job safely

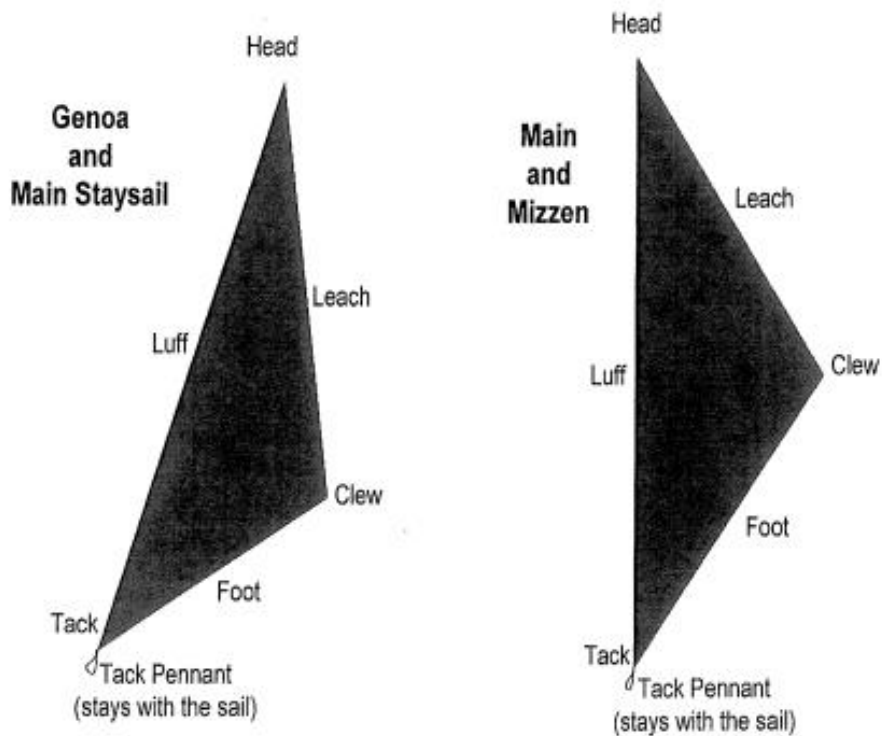
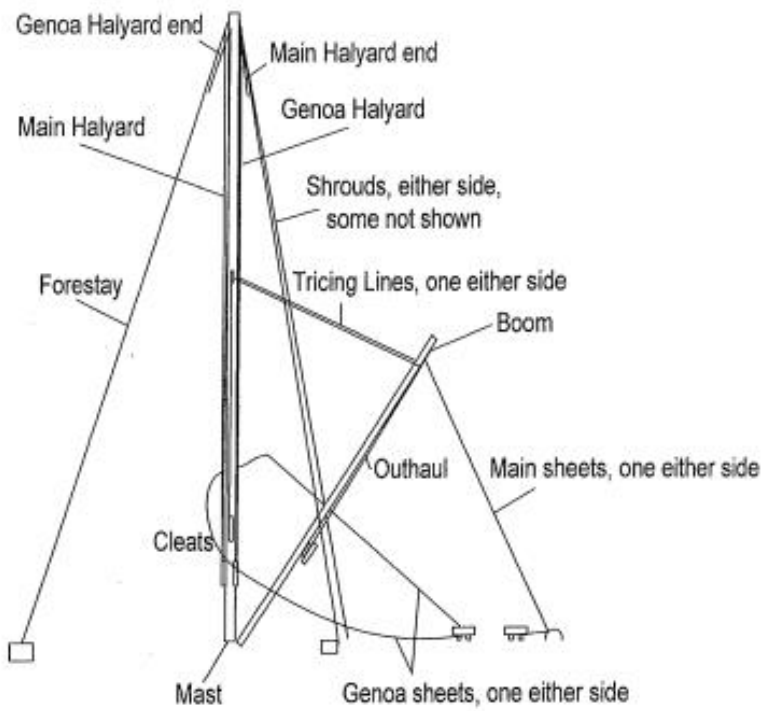
Spars & Rigging



Sails

The last part of the traditional sailing vessel we need to look at is the sails. Pick up any book on sail making and you will find that there is a large variety of different types of sails, as well as different variances of the same sail types. These variances may just be how the sail is mounted to the vessel, gaff topsails are a common one for this, to the cut of the sail. Here we are looking at using a generic diagram of Waka Sails

Sails and Rig Aotearoa One



Stay Sail

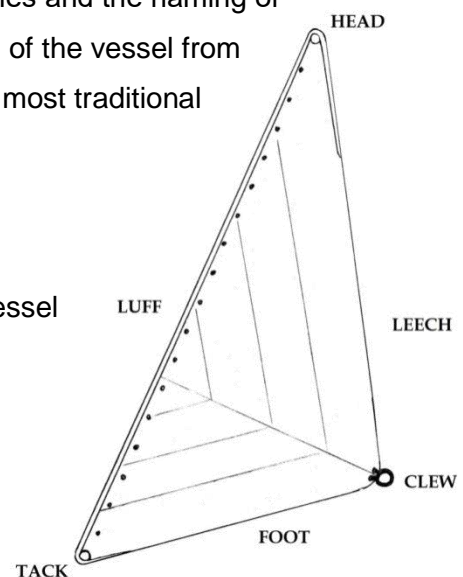
A stay sail is a triangular sail that are attached to a stay of the vessel. On some vessel's the foot of the stay sail can be attached to a boom at the clew. This is normally when the sail is mounted forward for the forward most mast. On square rigged vessel's the stay sails are most likely to be find between the masts and there can be more than one at different levels. The stay sails at higher levels will generally be fitted with a down hauls for lowering from deck.

- Halyard – used to hoist and lower the sail
- Sheet – used to ease out and haul in the sail
- Outhaul – used to tension and ease back the boom slide
- Topping lift – used to support the weight of the boom and sail when the sail is lowered

Jib/ Flying Jib

The jib is a triangular sail that is attached to a stay of the vessel, jib's are found forward of all masts on the vessel. The number of jib's a vessel carries varies and the naming of these also varies. A jib will have a sheet leading to each side of the vessel from the clew. It will also have a downhaul for lowering the sail as most traditional vessels have their jib out on the bowsprit.

- Halyard – used to hoist the sail
- Downhaul – used to lower the sail
- Sheets – used to set the sail on one side of the vessel or the other. There is a port and starboard sheet



Day to day care of sails

Salt spray leads to a build-up of salt crystals on sails and this gradually breaks down any protective finish. Ideally all sails should be washed out with fresh water at regular intervals to keep this build-up in check. This is not easy with such heavy sails, however, what can be avoided is packing sails away unprotected on the jetty, thus ensuring that cloth is well impregnated with grit and dirt and guaranteed a short (and Dirty) life.

Sail Handling

The term sail handling covers everything to do with using the sails to move the vessel through the water. This includes raising and lowering the sails and using the sails to manoeuvre the vessel through turns.

One of the first decisions that the Master/Kaihautu has to make each day is what sails to use. The main points to consider are the wind strength and direction, number and experience of the crew and the length of the trips. Each Master/Kaihautu applies these factors in a different way and comes up with different answers.

Not all sails are designed for all wind strength. It is the Master/Kaihautus decision on what sails are carried and when.

Aotearoa Ones wind limits are

Sailing Parameters			
Sail	Wind speed	Beaufort Scale	Sail type/size
Main/Mizzen	0 - 12kts	0 - 3	Full sails
	12 - 20kts	4 - 5	High wind/storm sails
	20kts +	5 +	No Sails, just motoring
Head Sail (are not to be used unless instructed by Te Toki Skipper)	-	-	-

Sail Commands used during Operations

Sailing Commands

Standby	Tu mai
Make Ready	Kia rite
Are you ready?	Kua reri?
Ready	Ae / kau
Be quick	Kia tere
Hoist the sail	Ra ki runga
Drop the sail	Ra ki raro
Make Fast	Kia mau
Go	Tukua
Open the sail	Huakina te ra
Close the sail	Katia te ra

Sheet / Tricing Commands

Ease out on the sheet	Waha ki waho
Sheet in	Waha ki roto
Stop	Kaati
Keep going	Haere tonu
Ease on the tricing	Whakatika te kutikuti
Trim the sail	Whakatika te ra

Hoisting Sails

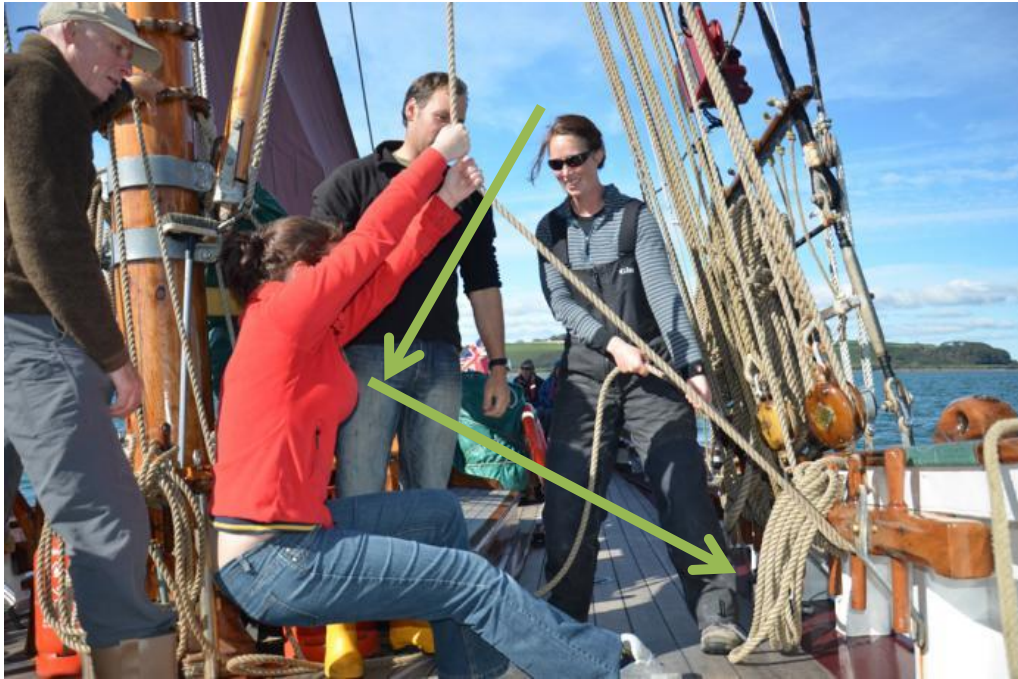
It's easier to hoist the main sails (main and mizzen) when there is no pressure in them. The point at which there is no pressure is when the vessel and the sail is pointing directly into the wind. There are two ways of achieving this; the first is by letting the sheet out until the sail is head to wind and the second is by turning the vessel so it is pointing into the wind. Pointing the vessel into the wind is the safer of the two options, but as the weather, tide and swell can affect the vessel heading, we also ease out the sheet a bit.

As each sail is hoisted they will affect the handling of the vessel, so to minimize this affect the sails are hoisted from the stern forward. Remember at all times the Master/Kaihautu must obey the Rules of the Road. When hoisting sails the Master/Kaihautu can't manoeuvre the vessel easily to avoid a collision, so hoisting the sails with least amount of wasted time is required. This means leave the stowing of lines until at least the Main and Mizzen have been hoisted, then the Master/Kaihautu can manoeuvre the vessel.

Before any sail is hoisted a check of all halyards aloft must be made to ensure that there are no twisted halyards or fouled blocks.

On the command "Make ready/Kia rite", the crew will release the halyards ready for use. On the command "Hoist the Sail/Ra ki runga", each sail to be hoisted.

Sweating and tailing;



"Jumping the halyard" is a technique used to raise a large sail quickly by employing a few crew members to work simultaneously on the halyard. The person *jumping* (in red) manually grabs the halyard as high as they can (sometimes this necessitates jumping) and pulling it down as fast and far as possible. While this crew member reaches for the next heave, a second crew member 'tails' or takes up the slack created by the jumper, on a belaying pin. When the person jumping can no longer pull up the sail simply by hanging on the halyard, he must "sweat" the line.

To "sweat" the halyard is to take as much slack out of it as possible.. To manually sweat a halyard, the sweater grasps the line and, in a fluid motion, hauls it laterally towards themselves, then down toward the deck, letting the *tailer* take up the new slack (as per green arrows).

Sail Lowering

The sails are normally lowered in the reverse order to hoisting, starting jibs and staysail and lastly the main and mizzen. Apart from the main and mizzen the other sails can be lowered at any time and with the wind from any quarter. As for hoisting the sails it is safest to lower the main and mizzen when the vessel is head to wind.

Again as each sail is lowered/dropped /Ra ki raro, they will affect the handling of the vessel, so to minimize this affect the sails are dropped from the bow/Tauhu aft. Remember at all times the Master/Kaihautu must obey the Rules of the Road. When dropping sails the Master/Kaihautu can't manoeuvre the vessel easily to avoid a collision, so lowering/Tricing the

sails with least amount of wasted time is required. This means leave the stowing of lines until at least the Main and Mizzen have been hoisted, then the Master/Kaihautu can manoeuvre the vessel.

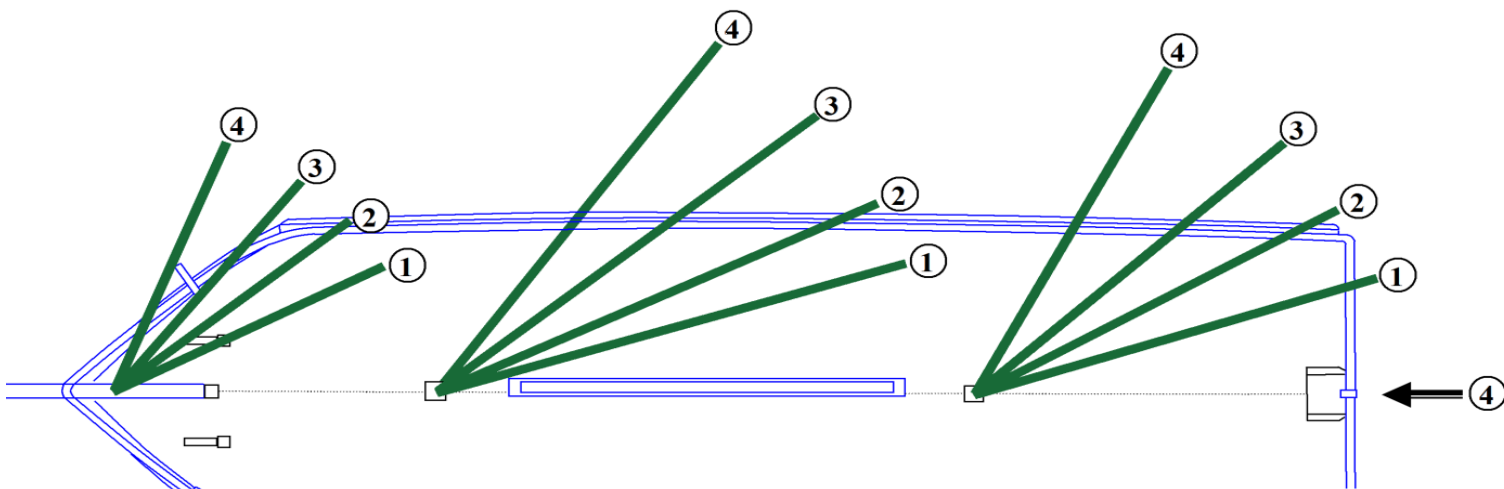
Setting Sails

By over sheeting the sails you just increase your leeway. It may look like you are sailing closer to the wind but check your course through the water and you will find that it hasn't changed. Also if the head sails (, jib and flying jib) are hauled in too tight they will cause the bow of the vessel to blow off (turn away from the wind).

The Master/Kaihautu will inform the Mate when the vessel is on the course that they wish to steer. When trimming sails you always start at the front and work your way back.

The easiest way of trimming a sail is to ease it out until the luff starts to backfill (this is called luffing) and then haul it back in a little. The sail is now trimmed. Backfilling is when the sail starts filling from the opposite direction from the wind. This is normally caused by the disturbed wind from another sail.

The image below shows the approximate positions of the sails for different wind directions.



All of the wind directions above apply to either port or starboard tack. The beam or the middle of the boat is used as a reference point. All terms relating to the boat are referred to as forward or aft of the beam.

Position	Wind direction – sail trim description
1	Winds forward of the beam – close hauled or close
2	Wind on the beam – reaching

- 3 Wind aft of the beam – broad reach
- 4 Wind aft-stern - running

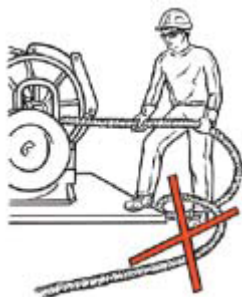
A vessel will not sail efficiently if the sails are incorrectly set. When in doubt ease it out; check the luff and trim the sail until the luff is only just full

Knowing the Ropes

The term “rope” is used to cover the many different types of cordage we use for a wide range of jobs at sea. While we use “rope” as a general term most ropes on-board will have a particular name according to their purpose and will be made of material suited to that purpose. You must become familiar with the particular name used for different ropes on your vessel, the materials they are made of and how to look after them.

Rope Safety

- Never stand in the bight or loop of a rope, weight may suddenly come on it trapping you



(See Bights below)

- Regularly inspect ropes to check for wear or damage, if on opening the rope's lay, dust or fibre fragments are found the rope may need replacing
- Because synthetic ropes stretch significantly before parting the broken ends will “snap back” in a cone about 30° around the direction of pull — never stand in this cone
- Remember synthetic ropes are very strong for their size and the fitting to which they are secured may break or give way first becoming a catapulted missile
- It is recommended to always carry or have handy a sharp knife to cut rope in an emergency.
- Beware ropes under strain they may part suddenly without warning

- Always ensure the fittings to which ropes are fastened are themselves securely attached to the vessels structure
- Be tidy with ropes, stow away those when not in use and coil up loose rope ends

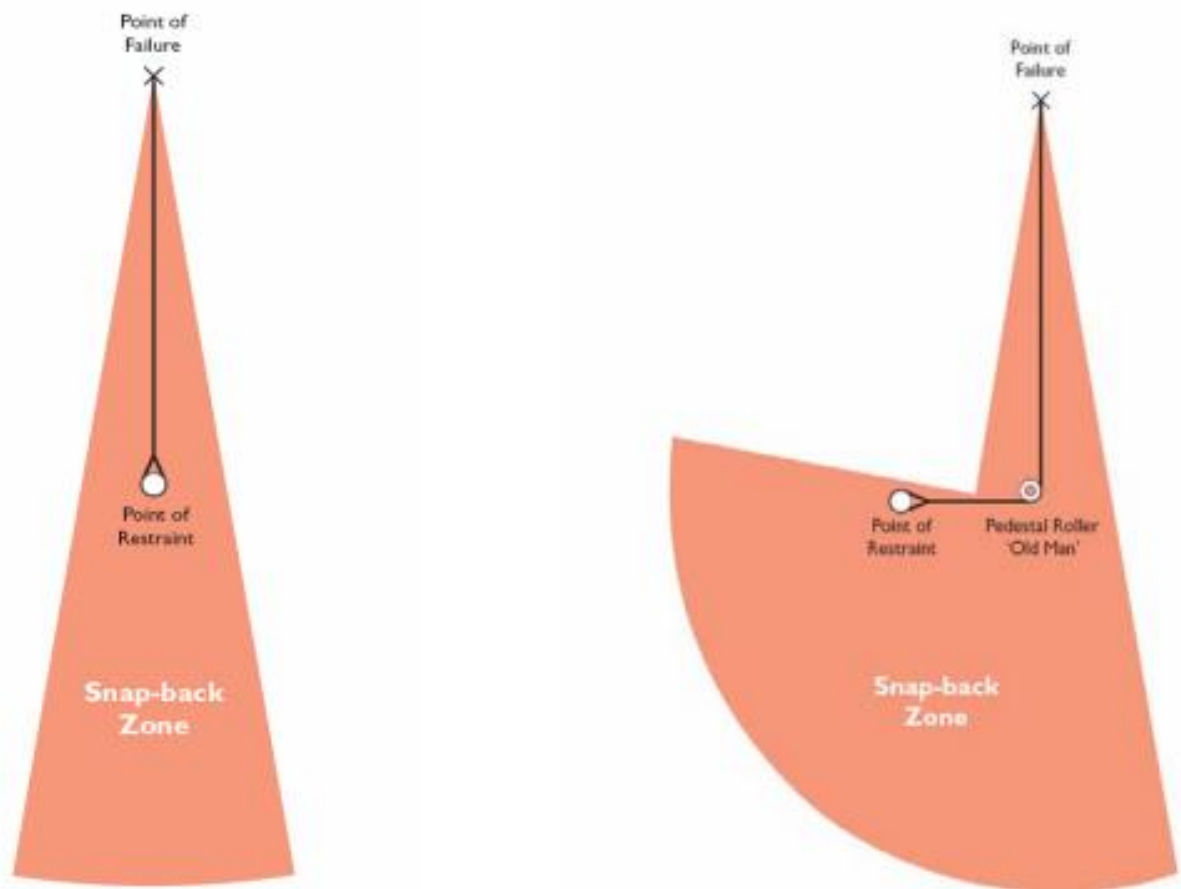
Snap-back zones from breaking lines

The following diagrams illustrate the danger zones when mooring lines break and snap backs occur :

Figure 1 : A simple snap-back recoil area (on a ship or on a quay) Figure 2 : A more complex snap back area with whipping around a roller.

Mooring lines are particularly dangerous because of the loads they carry and their ability to ensnare. These dangers have always existed on and near ships. Awareness of these dangers combined with a focus on safe working practices can prevent injury and death in areas where mooring operations are being carried out

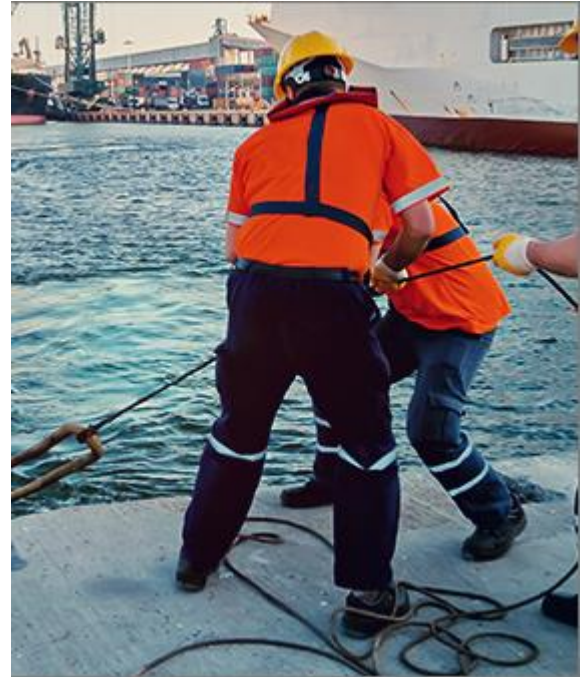
Securing a line correctly stops the line from slipping and prevents damage and injuries. All the working lines of the running rigging are secured to a Belay Pin or a Cleat.



Bights

Any rope or wire can be coiled, intentionally or by chance. A loop, coil or a section of loose line can injure or kill if the line suddenly tightens. These hazards are commonly referred to as 'bights'. The sudden tension of a line results not only in the tightening of any bights but also the rapid movement of the line towards the line of tension. This may result in any rope positioned off this line moving rapidly in that direction, lifting anyone or anything in its path.

Unexpected tension on a slack line must be avoided at all times, and all working practices involving lines should have this as a core principle. Any line that is stored or coiled should be as close to the line of tension as possible to reduce the possible consequences of any unexpected load, drum slippage or line movement. All temporary bights, loops or lines that are being deployed, stowed or recovered should be considered dangerous. People working in these areas need to watch closely how their feet are placed near bights or loops. Bights don't always look like bights. Here, a seaman has inadvertently stepped over the line and put himself at risk. Warning Bights in lines are dangerous. NEVER stand inside a bight. Know where your feet are while you work and regularly check that your feet are outside any bights.



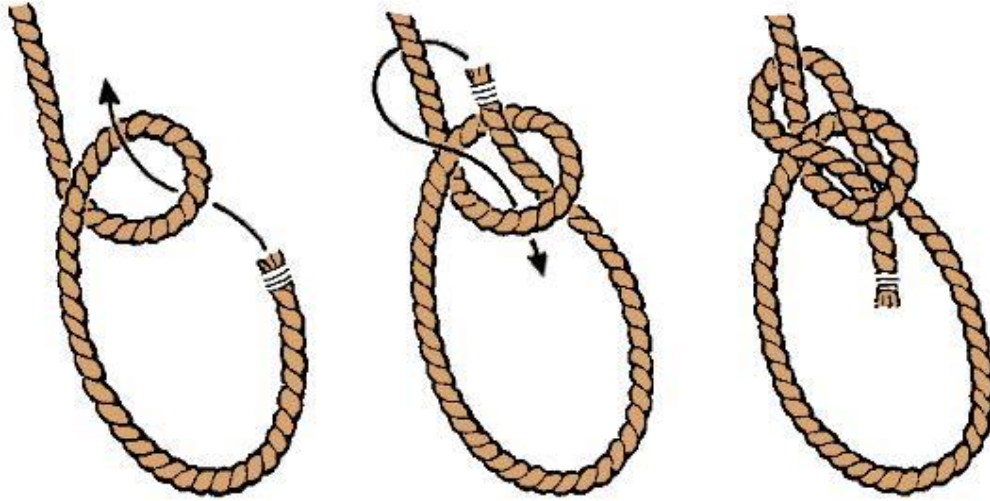
Getting Knotted

As a seaman you are going to need to join ropes together and secure ropes to fittings every day.

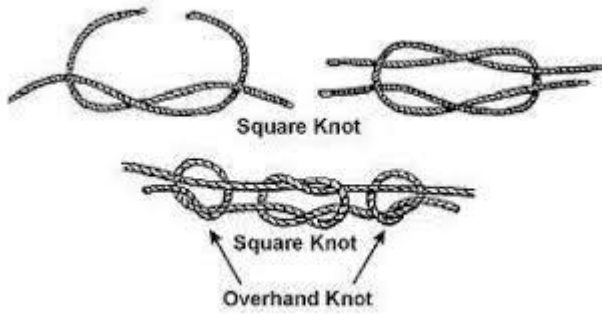
To do this the number of knots, bends and hitches available is countless but there are a few common ones which meet most needs and which you must be competent to tie. Each of these knots has a particular purpose and it is important that you choose the right one for the right job.

Bowline

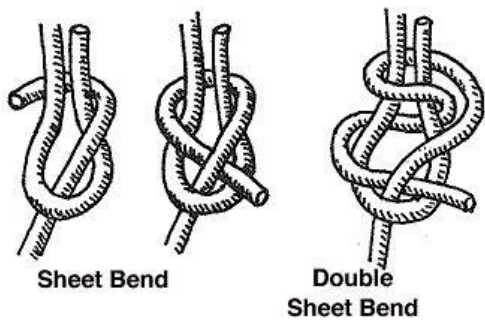
bowline



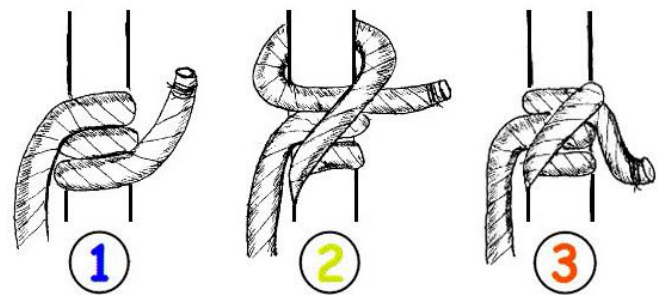
Reef Knot



Sheet bend and Double Sheet bend

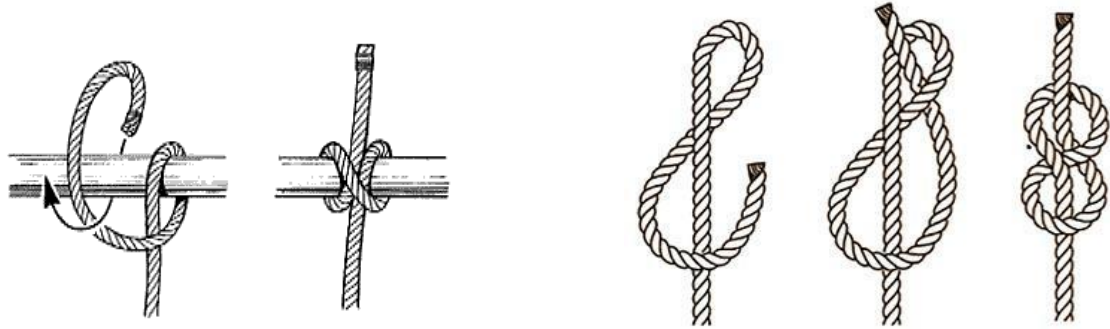


Rolling hitch



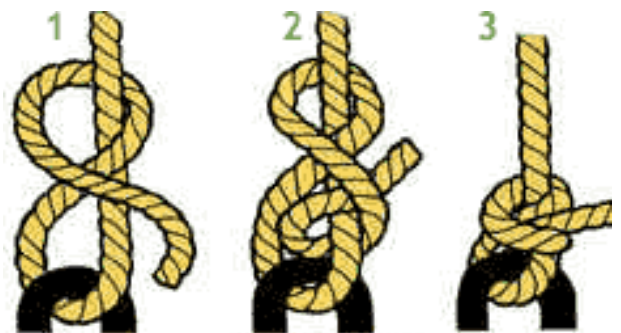
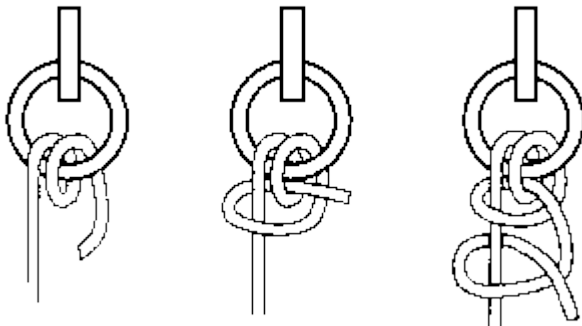
*Clove hitch **

Rope Stopper/Figure 8

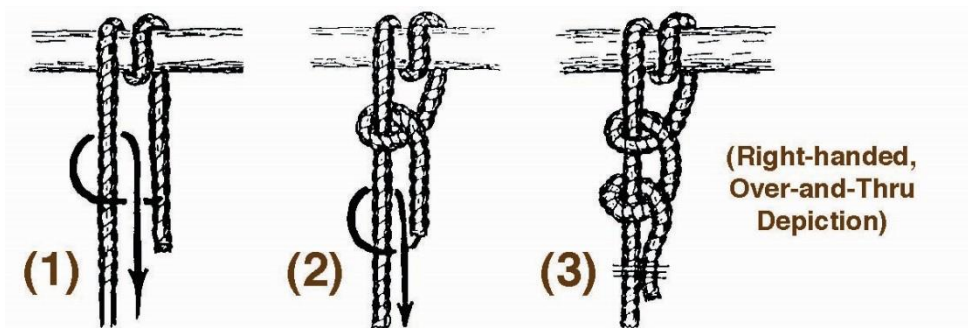


Anchor Bend

Buntline Hitch

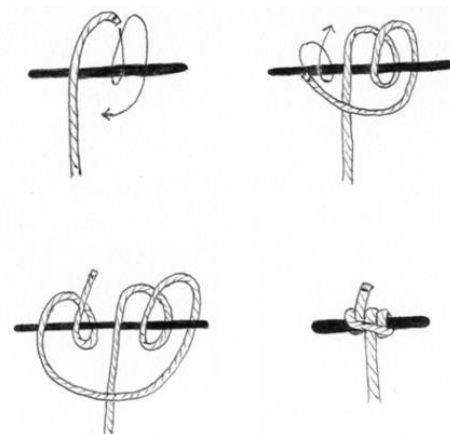
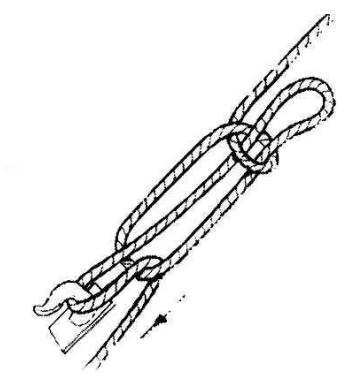


Round turn and two half hitches

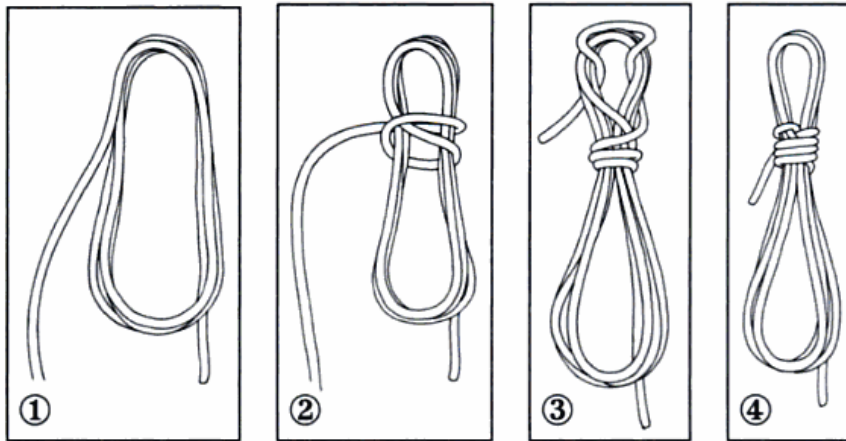


Waggoner's hitch

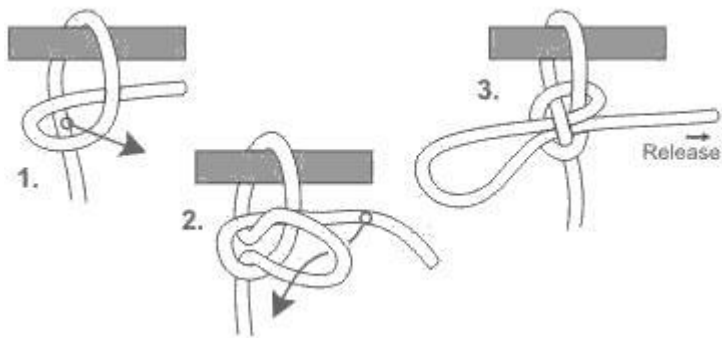
Rolling hitch



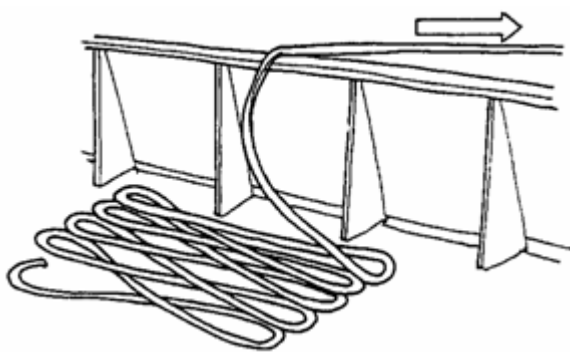
Gasket hitch



Slippery hitch



Flake a rope



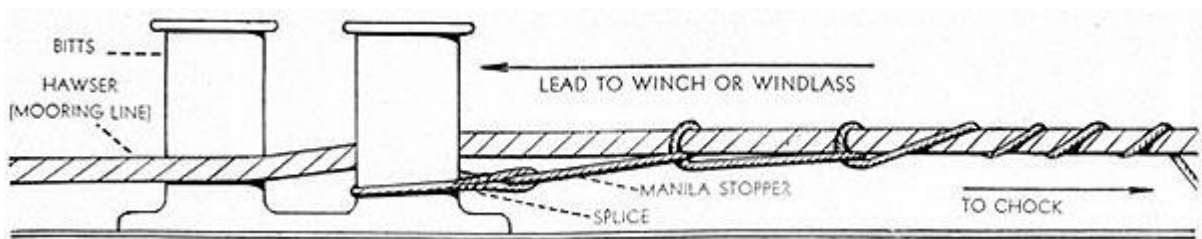
Rig and use a rope stopper

Rat Tail Stopper

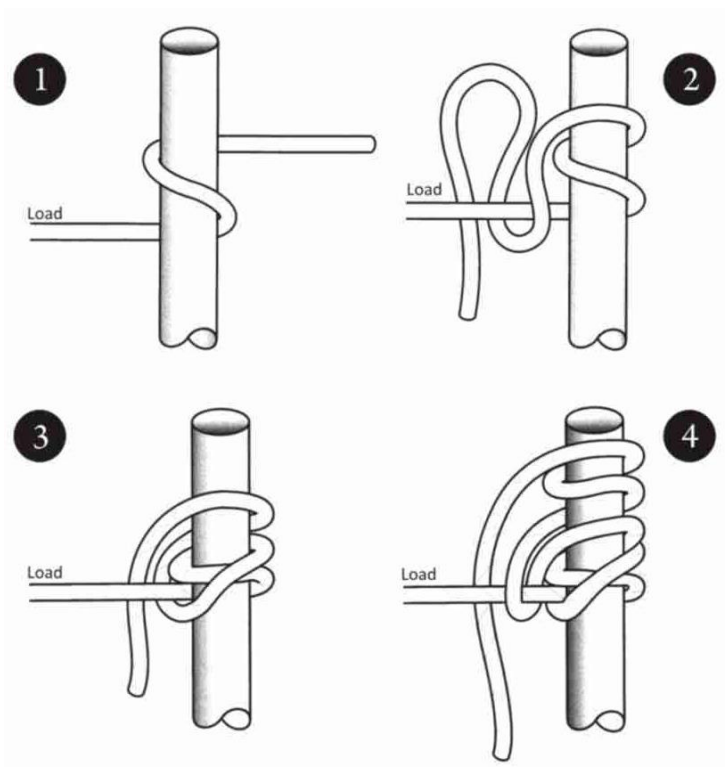




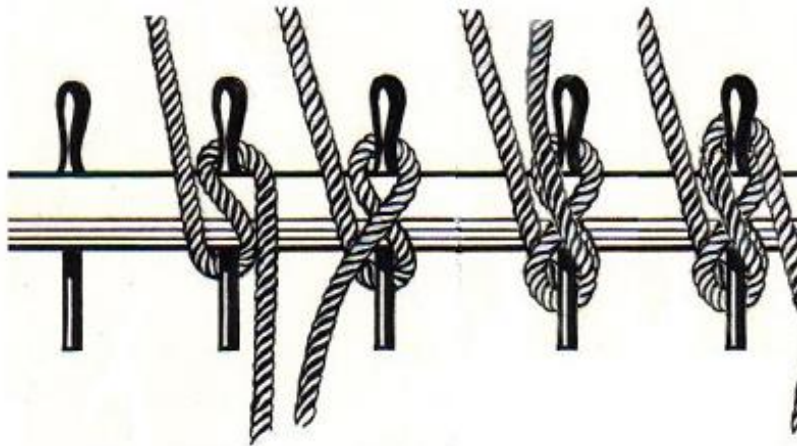
Single Line Choke Stopper



Bollard (Lightermans) Hitch



Securing to a Belaying Pin



Securing to a Belaying Pin with Deck Hook



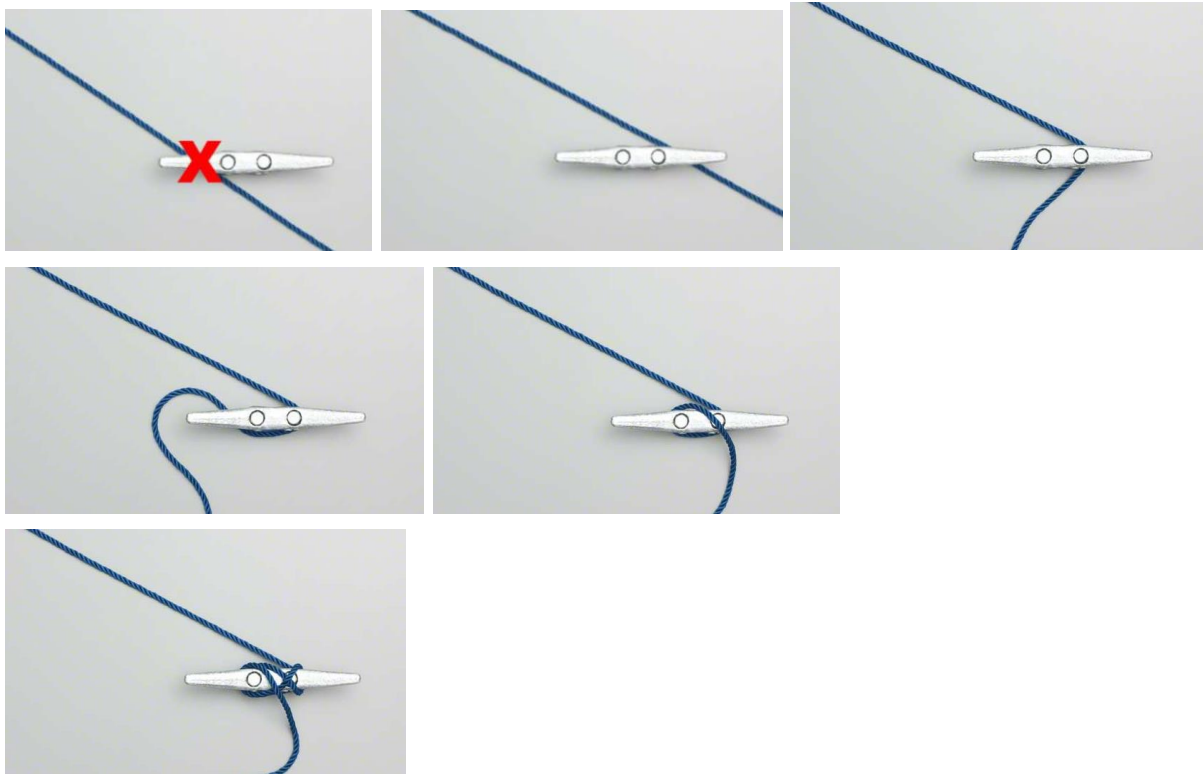
Continue as for direct to belaying pin.

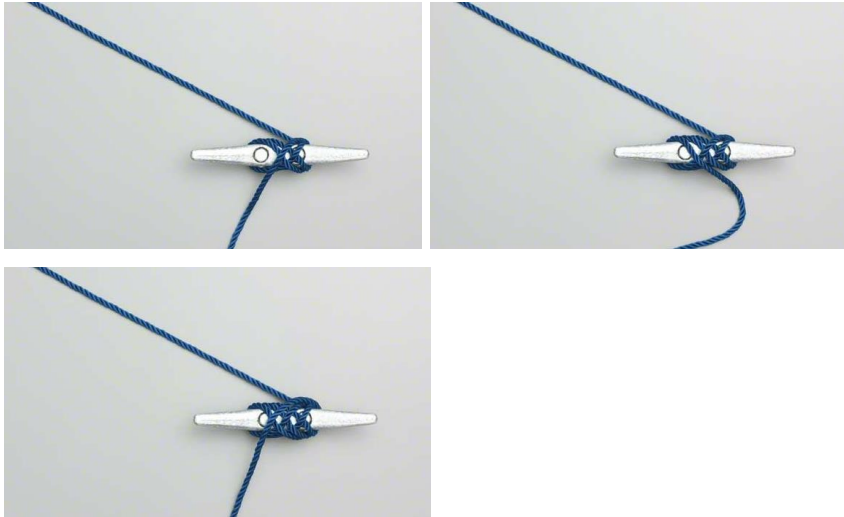
Coiling a Line onto a belaying pin

Pull a loop through the last figure of eight cross.



*Belaying
to a
Cleat*





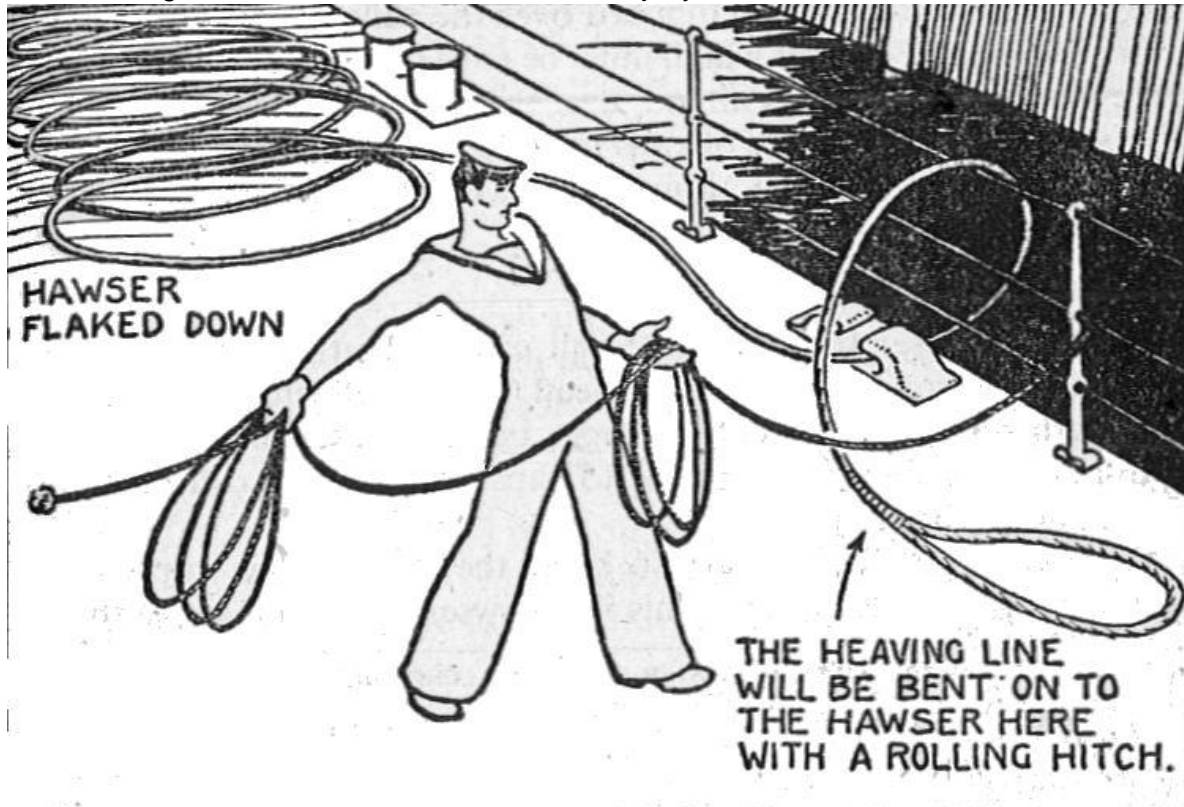
No Locking Hitch? When a Locking Half Hitch must be avoided:

- **Heavily Loaded lines:** The locking hitch may bind tight and become impossible to remove without cutting
- **Large Vessels:** The uniform practice on large vessels is to never add a final Half Hitch.
- **Towing:** Never add a Half Hitch on either end of a towline. First, a towline should always be monitored. Second, the ability to quickly release either end is essential.
- **Sheeting a Sail:** Avoid a Half Hitch for the sheet controlling a sail – rapid release may be critically important in preventing a disaster, e.g., a capsized.

Instead of a locking hitch a full turn around the cleat will equally lock the line

Heaving Line

A “heaving line” is used to pass heavy lines to the jetty, this is a light line with a heavy knot called a “monkey’s fist” in one end. The line is thrown ashore and the inboard end secured to the mooring line which is then heaved on to the jetty.



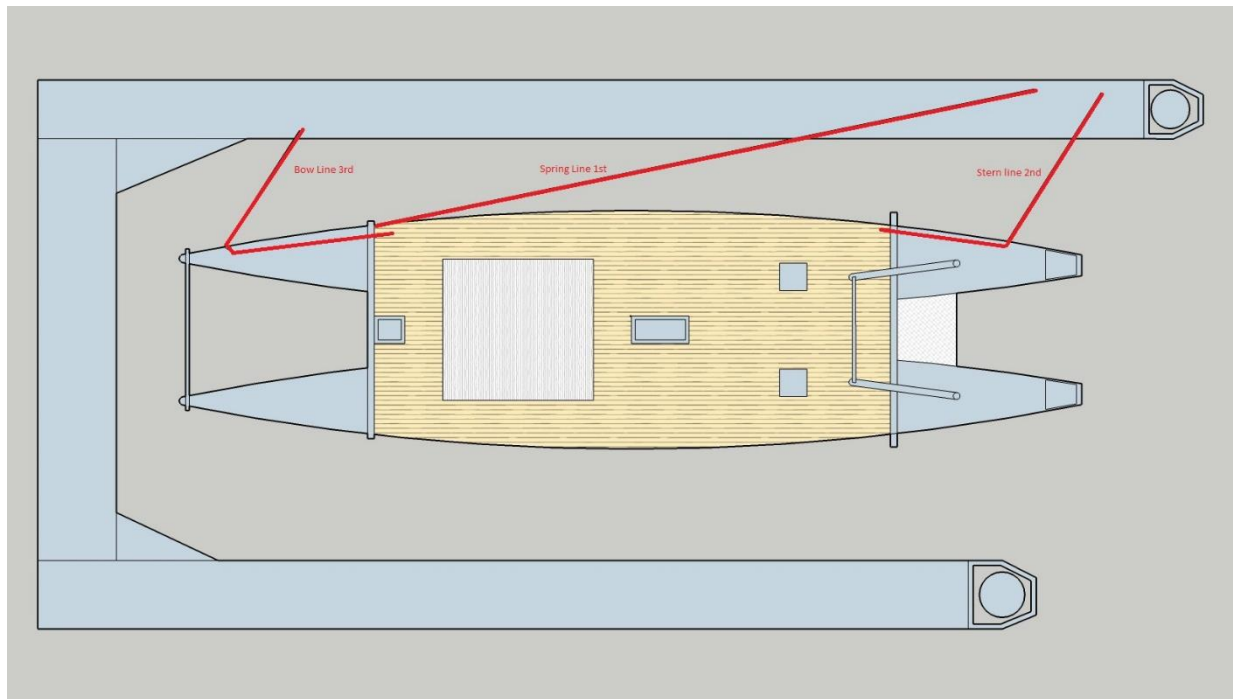
Note how the coils in the left hand are carefully laid so as they will run free.

Securing Alongside and Letting Go

A vessel's voyage usually starts from and finishes at an alongside berth at a wharf or jetty. The process of berthing at or letting go from an alongside berth is an important seamanship evolution and one that you will regularly participate in. The success of these evolutions relies on everyone playing their part and good communications between the berthing stations fore and aft and the bridge.

Mooring at the NZ National Maritime Museum

Holding Position while boarding and disembarking

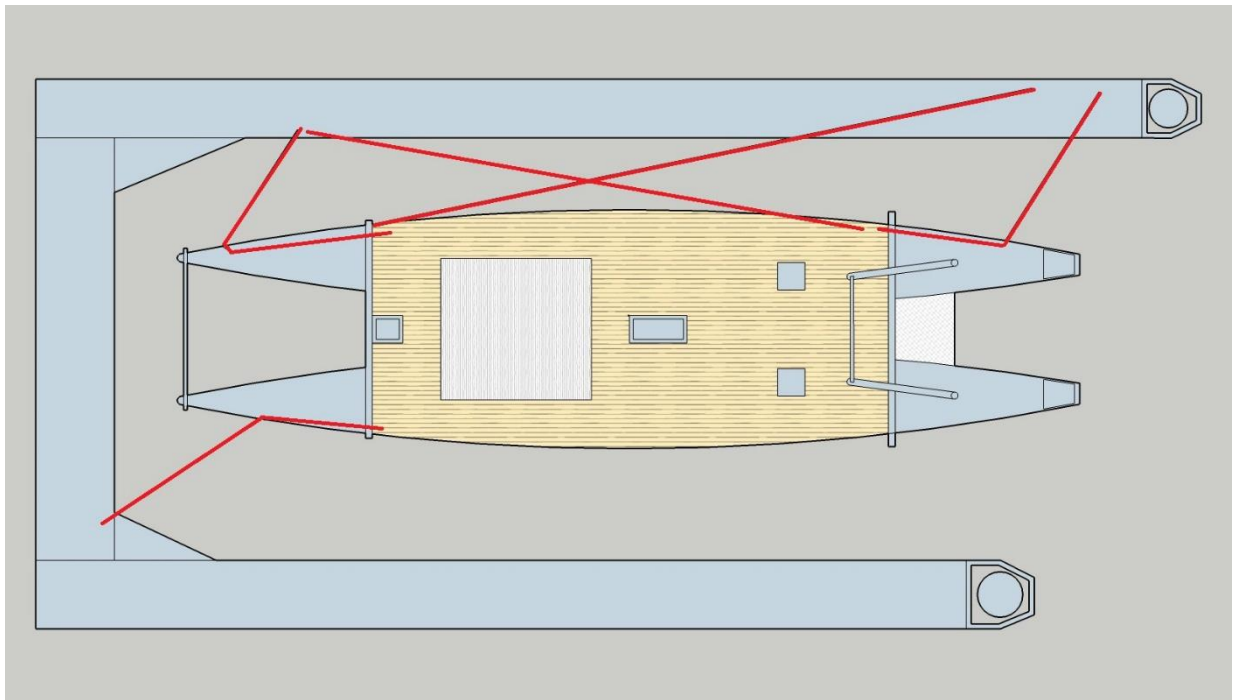


Departing the Berth

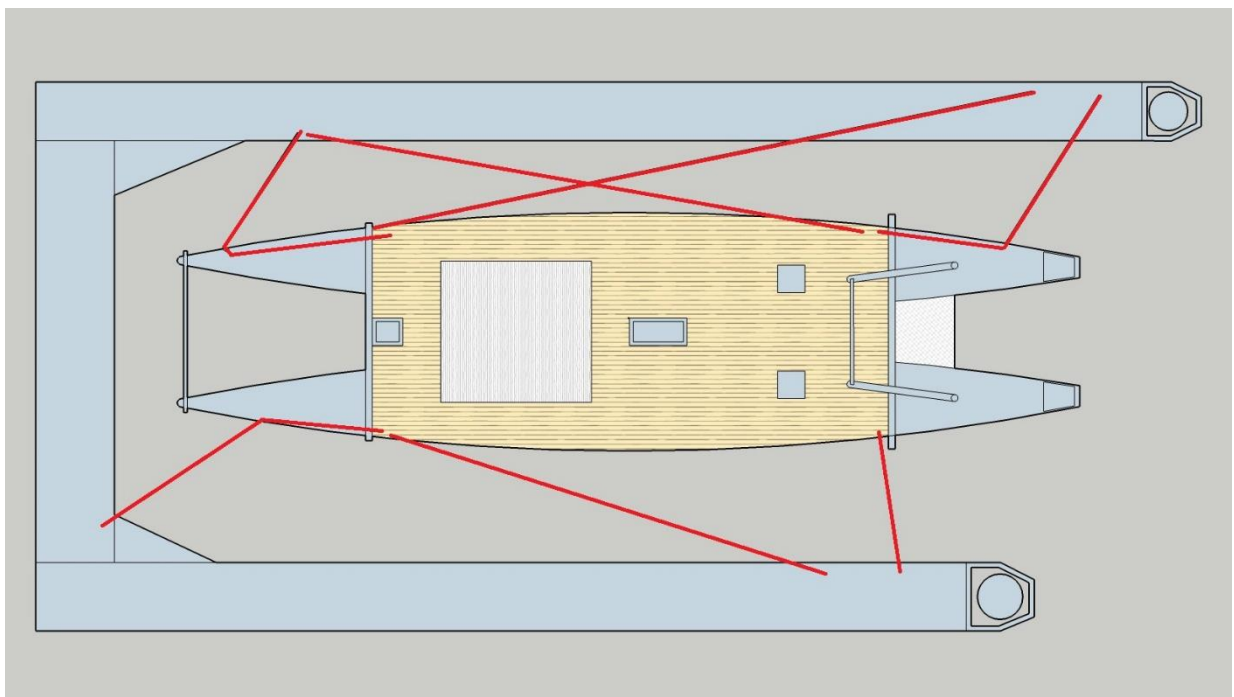
Arriving at the Berth

1. First line on is the Spring
2. Once Spring line is on cleat make call 'Spring On'

Overnight mooring in calm conditions



Overnight Mooring in Stormy Conditions



Fenders

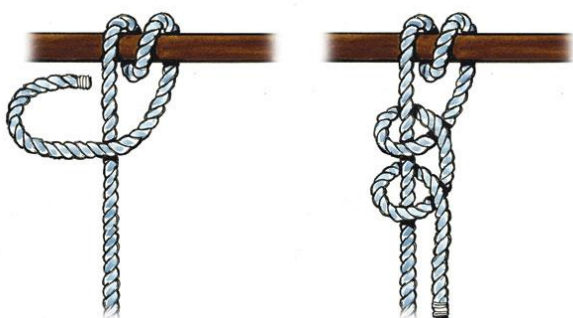
Securing Fenders

Use the right knot as losing the fender may cause a lot of damage to your vessel

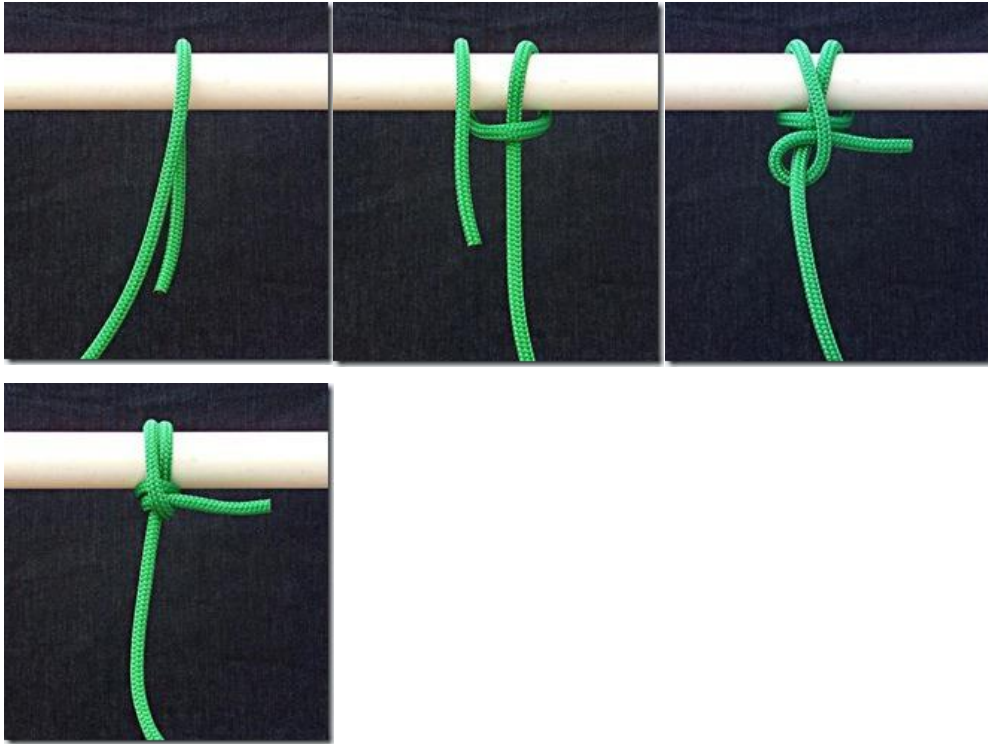
A clove hitch is not a suitable knot as when the boat is pushed hard against the quay the rope will slowly slide through the knot and the fender will end up positioned too low or fall off.

When attaching fenders over a lifeline or rail some options are;

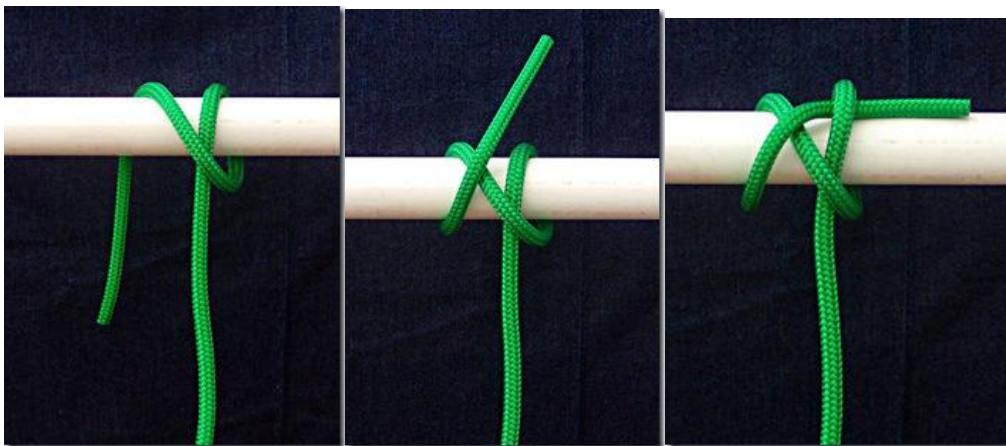
Round turn and two half hitches



Lees Fenders Knot



Spar Hitch



To secure fenders, I use lines, which are strong, chafe resistant, and easy to tie and untie. Don't use polypropylene, as its innate slipperiness makes it unreliable

Anchoring

Anchors are used to temporarily hold the ship in position, to assist in manoeuvring or to stop the ship in an emergency.

A range of equipment and specific terminology is associated with anchoring and anchor equipment, all of which you must be familiar with before attempting to use the anchors.

For Harbour operations the Anchor is only likely to be deployed in an emergency and for this reason will only be operated by a Dechand/Kaumoaana or under direct supervision of a Toa/Mate

Anchor Ball



Day shapes are black in colour and their sizes are determined by the COLREG, for instance the size of the *ball* is not less than 0.6 meter diameter. The vertical distance between shapes is at least 1.5 meters. Vessels of less than 20 meters length may use shapes of smaller size commensurate with the size of the vessel. Day shapes of standard and reduced sizes are both commercially available. Day shapes are commonly constructed from a light weight frame covered with fabric and are designed to be collapsible for ease of storage.

Day shapes are designed to correspond to the various navigation lights required to be shown at night, and are required to be complied with by day from sunrise to sunset. The appropriate lights may also be displayed during the day at times of restricted visibility or other necessary circumstances. Vessels under 7 meters are generally not required to display day shapes even if they are required to display lights at night

The day shape for anchoring is a black ball.

Steering

An important duty as a Taura/Competent Crew is the ability to steer well either by eye on an object the skipper has indicated or by compass. To become a good helmsman takes practice and experience in a variety of sea conditions, so make best use of opportunities as they arise.

The ship is steered by the tillers/Hoe rua. Major alterations of course are usually directed by the Master/Kaihautu using standard helm orders to which the helmsman/Kai Urungi makes standard responses to confirm the orders are correctly complied with. Once steady on a new course the helmsman uses the tiller/... appropriately to maintain the course.

When steering by eye the helmsman keeps the ship's bow pointing at an object, such as a distant lighthouse, indicated by the skipper.

An example of the steering orders and responses that might be used when altering course from 220 to a new course of 270 are as follows:

Master/Kaihautu - 'Starboard 15 altering 270'

Helm - "Starboard 15 altering 270"

When steering by compass the helmsman keeps the "lubber's line" aligned with the appropriate degree division on the compass card. Here it is important to remember that the compass card remains steady while the ship swings around it. To ensure the compass works well we must look after it and ensure we do not cause any unexpected deviation by careless placement of metal or electronic objects.



Other commands include;

Go to Port

Go to Starboard

Go to Midships

Hard to Port

Hard to Starboard

Prepare to tack

Tack

Prepare to gybe

Gybe

Taha maui

Taha matau

Waenganui

Taha ake maui

Taha ake matau

Tu mai ki te whakatumuu

Whakatumuu

Tu mai ki te whakahiku

Whakahiku

Lookout

Under the international Regulations for the Prevention of Collisions at sea (Maritime Rule Part 22) it is the duty of every vessel to maintain a proper lookout by all available means. Despite this, the analysis on many collisions shows that a lot of vessels fail to comply with this fundamental safety precaution and legal requirement. If you are carrying out the duty of lookout it is important that you fully understand what is expected of you and that you carry out your duties diligently. Ask if you are unsure about what you have to do. If through illness or fatigue you feel you are unfit for lookout Duty you must report it to the skipper or officer of the

watch (00W). Your company procedure will detail how to advise that you are unfit for duty.

When acting as lookout you are the eyes and ears of the ship and must report anything of interest to the Master/Kaihautu/officer of the watch. Such things will include other ships and their movement, navigational aids such as lights, lighthouses and buoys, hazards such as rocks or overfalls, and anything unusual. Use your ears and other senses as well and be alert for anything unusual happening in your own vessel such as the sight or smell of smoke or unexpected noises.

At night your eyes adjust to the low light conditions and you gain what is known as “night vision” which improves your ability to see in the dark. To preserve night vision avoid bright lights and if you wear spectacles do not use transition lenses.

When reporting contacts of interest it is important to report them in a clear and precise manner that is readily understood by the officer of the watch or skipper. Different ships will have their preferred method for such reports and you must become familiar with the procedure used in your ship.

A common method used is to reference the contact’s position to your vessel’s bow or beam in terms of “compass points”. Traditionally the compass is divided into 32 points with each point equivalent to 11.25 degrees.

For example a vessel 20 degrees on the starboard bow would be reported as being “two point on the starboard bow” while a contact 80 degrees on the starboard bow would be reported as being “one point forward of the starboard beam”.

A better method of reporting contacts is based on their direction relative to the ship’s bow and whether they are near or far away.

For example, a ship 70° on the port bow on the horizon would be reported as “Ship red seven zero far”, while a yacht 20° on the starboard bow at one mile would be reported as “Yacht green two zero near”.

Another popular way of reporting the relative bearing of contacts is to consider your vessel as the centre of a clock face kind report contacts according to their position around the clock. For instance a vessel right ahead would be at “twelve o’clock”, while one on the port beam would

be at “nine o’clock” and so on.

Once a contact has been reported it is important that its movement is monitored to determine if a risk of collision exists. If the contact’s bearing remains steady or only changes very slowly then a risk of collision exists and action must be taken in accordance with the collision prevention regulations (Maritime Rules Part 22) to avoid this occurring.

While we must always keep an all-round lookout on occasion you may be asked to particularly keep a lookout astern when the ship is manoeuvring to or from her berth. You will be providing the “eyes” over a sector the Master/Kaihautu cannot see from the bridge. In this role it is very important that you keep alert to changing hazards, estimate distances with care and provide clear reports.

Lookout Duties

It is the responsibility of the Master/Kaihautu to navigate the vessel safely, but it is the responsibility of ALL crew members to keep a lookout for other vessels or objects in the water that may compromise the vessel’s safety. Part 22.5 of the New Zealand Maritime Regulations states the following for Look Out:

‘Every vessel must at all times maintain a proper look-out by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions, so as to make a full appraisal of the situation and the risk of collision’

Part 22 of the New Zealand Maritime Regulation is known as the Collision Prevention Rules, or more generally known as the ‘Rules of the Road’. Part 22 states who has to give way when two vessels are crossing each other’s course. Part 22 is the most important piece of maritime law that a Master/Kaihautu learns when getting their commercial qualification.

As lookout you are required to be able to determine if another vessel is going to cross your vessel’s course. If you wish to learn all the Rules of the Road Maritime Museum recommends the Coastguard Boatmaster/Kaihautu course as a good introduction course to the Rules of the Road.

If you sight another vessel or object that may come anywhere near the vessel you must report it to the Master/Kaihautu.

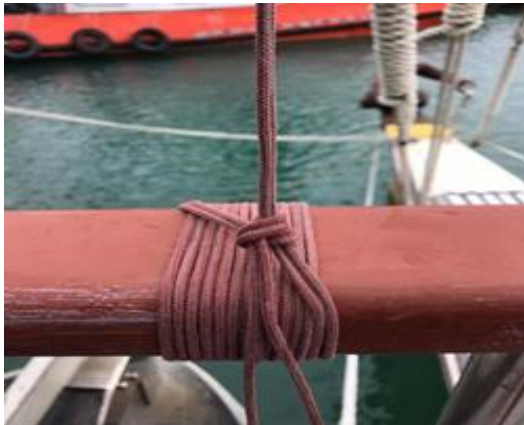
Never assume the Master/Kaihautu has seen it. On board the vessel the person who will make the call as to the risk of collision is the Master/Kaihautu.

Here are the basic rules that you need to learn for your duties as a lookout.

Maritime Museum vessels come under two different classifications of vessels.

Power Driven Vessel: this is at any time when the engines are being used to propel the vessel through the water. If the sails are up and the engines are being used the vessel is still a Power

Driven Vessel. If this is the case, the motor sailing cone should be raised, which is attached to the Starboard Rail Forward.



HEALTH AND SAFETY

Many hazards are faced at sea and in the maritime environment, so much effort is put into eliminating these dangers or minimizing them to the greatest degree possible. The strategies we use to make the maritime workplace as safe as possible include the development of good operating practices, safe and well maintained equipment, the ongoing training of crew and overall, fostering a safety culture on-board that is alert to hazards and strives continuously to reduce them.

Safety in the work place is governed by the 'health and Safety in Employment Act 1992' which sets out the responsibilities of employers and employees.

Some of the important points from the Act covering safety in the workplace are recorded below to assist you understanding your responsibilities and those of your employer. If you want any further details go to www.legislation.govt.nz

Employers to Ensure Safety of Employees

Every employer shall take all practical steps to ensure the safety of employees while at work; and in particular shall take all practical steps to —

Provide and maintain for employees a safe working environment; and

Provide and maintain for employees while they are at work facilities for their safety and health; and

Ensure that plant used by an employee at work is so arranged, designed, made and maintained that it is safe for the employee to use; and

Ensure that while at work employees are not exposed to hazards arising out of the arrangement, disposal, manipulation, organisation, processing, storage, transport, working, or use of things in their place of work; or near their place of work and under the employer's control; and

Develop procedures for dealing with emergencies that may arise while employees are at work

Duties of Persons who Control Places of Work

A person who controls a place of work must take all practical steps to ensure that no hazard that is or arises in the place harms —

- People in the vicinity of the place (including people in the vicinity of the place solely for the purpose of recreation or leisure)
- People who are lawfully at work in the place as employees of the person

Duties of Employees

- Every employee shall take all practical steps to ensure —
The employee's safety while at work including using suitable protective clothing and suitable protective equipment; and
- That no action or inaction of the employee while at work causes harm to any other person

A key component in our effort to stay safe on-board is the "Marine transport Operators Pan" (MTOP) which encompasses all elements of a vessel's safe operation. Amongst the safety topics the MTOP addresses are:

- Equipment Maintenance Schedules
- Training
- Hazard Identification and Minimization
- Emergency Equipment
- Emergency Procedures
- Operating Procedures

The MTOP details all this information for your vessel and as a member of the crew you must follow its guidance to best ensure the safety of all.

Hazard Management

Being alert for hazards is vital to remaining safe. A hazard is anything in the workplace that causes, or has the potential to cause, harm to you or anyone else in the workplace. New hazards can arise due to the installation of new equipment or as a result of wear or damage to an existing item. Have a look around your vessel and identify six potential hazards, two that can be eliminated, two isolated and two minimised. For example, rotating machinery might be isolated with a guard rail, while the hazard of the wet decks could be minimized by signage.

Accident/Incident Reporting

Another way we manage hazards is to report and investigate accidents or incidents when they occur. The purpose of this is to try and determine the circumstances that led to the event and hopefully learn from these so that we can prevent it happening again. Commercial vessels are required to report accidents and incidents to Maritime New Zealand (MNZ) so that this analysis can be undertaken.

While it is the Master/Kaihautu's duty to render accident and incident reports to MNZ, as a member of the crew you may be witness to the event and be able to supply important information that will assist in providing a full picture. Your company may well have its own accident or incident reporting form and you should be familiar with completing these.

Fatigue

Fatigue, caused by lack of sleep or disturbed sleep and exacerbated by bad weather or heavy workloads, is a major contributing factor in a significant proportion of maritime accidents. International studies have revealed that the risk of an accident rises rapidly after the ninth hour of continuous work, doubles by the twelfth hour and triples by the fourteenth.

Like many aspects of work in the maritime industry your management of fatigue starts the day before you commence your duty. You should ensure you are well rested prior to reporting on-board. The management of fatigue in your vessel will be covered in your MTOP Manual and you must follow its guidance for everyone's safety.

Personal Protective Equipment (PPE)

Under the Health and Safety Act it is the duty of an employer to make the workplace as safe as possible by eliminating, minimizing or isolating hazards. One of the processes by which this is done is the provision of PPE to provide a final barrier between the employee and the hazard. It is important to understand PPE in this role as a final barrier between you and a danger rather than considering it an optional extra.

Harnesses

Maritime Museum vessels have a number of different types of harnesses, ranging from four points to six point harnesses.

A four point harness goes over each shoulder and under the each arm pit. This type of harnesses is easy to slip out of in a fall, so should only be used on deck or out on the bowsprit. It is NEVER to be used aloft.

A five point harness is the same as a four point harness, but it has an extra strap which starts at the back and then passes between the legs and attaches at the front. As long as the harness is tightened correctly the wearer will not slip out in a fall. The five point harness is the most common type on Maritime Museum vessels.

The last type is the six point harness. Like the four point harness, two straps go over the shoulders and two under the arm pits. Lastly for each leg there is a strip that goes around the top of the leg. In a fall these two strip stop you falling.

For each of the different types of harness there should always be two lanyards attached to the harness. A lanyard is a line attached to the harness with a clip on the other end used to attach to the rigging. This is so at all times aloft you can be clipped on.

Vessel Cleanliness

Keeping your vessel clean and tidy contributes to the health and safety of all on-board. You will be shown how to clean effectively and efficiently to maintain the required standard. As some cleaning products and procedures can be hazardous you will also be trained in safe practices so that you, other people and the environment are protected.

Garbage

Garbage is the everyday rubbish that is the result of your normal boating operations with the exception of oily waste, might include:

- Food
- Plastic bags and wrapping materials
- Bottles and cans
- Paper and cardboard
- Scrap timber
- Bait packaging and strapping
- Old or damaged fishing nets, lines, buoys and sinkers
- Rope
- Rags
- Cigarette butts
- Batteries
- Packaging materials

Simply put, if it is something you would put in the bin at home then it is garbage.

Garbage laws for vessels

The management of garbage on boats is regulated by the International Convention for the Prevention of Pollution from Ships and its Protocol, known as MARPOL.

Annex V of MARPOL contains the international regulations on garbage from ships, and most of these regulations apply to all ships. In New Zealand the MARPOL regulations are enforced under the Resource Management (Marine Pollution) Regulations, the Maritime Transport Act, 1994 and the marine protection rules Part 170.

Here is a summary of the current rules:

- Plastics may not be discharged into the ocean anywhere at any time. This includes items that have any plastic component and also synthetic fishing gear.
- No garbage of any sort may be discharged at sea within 3 nautical miles from the nearest land or in the Antarctic area below 60 degrees south.
- Between 3 and 12 nautical miles from land garbage must be ground up to the size of pieces that would fit through a 25mm screen in order to be discharged. Any bigger and it must be retained.
- Outside 12 nautical miles it is permitted to dump food, paper products, rags (as



long as they are non-synthetic and not contaminated with oil or chemicals), glass, metal and similar items.

- Garbage that is likely to float such as wood may only be discharged more than 25 nautical miles from land.

All vessels over 12 metres must have signs on board that explain the garbage laws. Large vessels over 400 gross tonnes are required by law to have a garbage management plan on board and keep a garbage record book.

Fishing operators have reported a range of challenges to managing garbage on-board for example:

- Space on the boat is limited.
- It takes time to manage garbage.
- The waste facilities back at shore are limited in some locations, meaning you may have to take garbage elsewhere for disposal.
- Items are lost accidentally over the side in rough weather.

Many operators have come up with simple ways to effectively and easily manage their garbage. Here are some solutions.

Smaller vessels are not currently required by law to have a garbage management plan. But a plan is a useful tool for working out how garbage will be managed and making sure everyone is aware of the practices on board.

A garbage management plan will include information on:

- Reducing garbage before you sail.
- Collecting and storing garbage.
- Processing of garbage (such as compaction, grinding or incineration).
- Procedures for using any equipment such as incinerators or grinders.
- Discharge of garbage ashore.

Who is in charge of managing garbage and making the plan work.

Everyone on board should be familiar with the plan and understand that they have a responsibility to make it work. If one person decides it is easier to throw a scrap of rope or a cigarette butt over the side than put it in the bin then the plan is not working.

Below we have provided some ideas that are working for other people. These suggestions can be adapted to suit your own boat and fishing methods.

Reduce garbage before you sail

How much garbage can you get rid of before you leave port? Try removing all excess packaging before you leave on the trip. It will save time when you are at sea or when you get back to port, and it will reduce the garbage you have to deal with at sea.

Rules for all vessels:

- Oil or oil-contaminated solid waste (rags etc) must not be discharged
- Oily water can only be discharged more than 12 miles from shore while the vessel is under way.
- Any oily water must have been treated so that the oil content of the water is no more than 15 parts per million. At this concentration there should be no visible oil in the water.
- Oily water with an oil content higher than 15 parts per million must be held on board and discharged to shore. In this case the vessel needs enough space to store the waste.
- Because of the risk of an oil spill, any damage or breakdown of a vessel longer than 15 metres that affects the safety of the ship or affects your ability to navigate must be reported to Maritime New Zealand (Phone 0508 472 269 or contact Taupo Marine Radio)
- Any spill of oil in New Zealand marine waters out to 200 nautical miles, or from any New Zealand registered ship no matter where the spill occurs, must be reported immediately to the local Regional Council or to Maritime New Zealand (Phone 0508 472 269 or contact Taupo Maritime Radio)

Passenger Service

As a crew member, passengers will look to you for guidance and support particularly when they are feeling stressed such as during periods of rough weather or any emergencies. You must develop confidence in dealing with passengers and this will come through thorough knowledge of your job and ship. Some passengers such as those with special needs may particularly need your assistance at any time, especially in an emergency situation.

Passenger Safety Briefing

- Hazards of the deck
- Location and fitment of life jackets
- What to do in an emergency
- Location and use of heads
- Introduce the mate and crew
- An overview of the planned course and which sails are going to be used
- Any special instructions for the voyage
- Keep it simple and clear
- Point out the hazards
- Explain what to do and why you are doing it

First Aid Kit

As the Maritime Museum vessels are set up mostly for day trips their first aid kits contain only the basic supplies. A list of the items in the first aid kit is in the SOP's.

Maritime Museum Master/Kaihautus and Mates are required to have a current first aid certificate.

Emergencies On-board

Life Buoys

Great effort is made to ensure that a vessel operates safely. This is achieved by fostering a safety culture on-board where hazards are identified and then eliminated or minimized, safe operating procedures are employed and ongoing training is undertaken to reduce risk. Despite these efforts emergencies can still arise from time to time and it is important that the ship is organized to minimize their impact when they do.

A key element of the ship's organization for emergencies will be the 'Emergency Muster List' or 'Safety Plan', This list details vital emergency information including:

- The General Emergency Alarm Signal used to advise everyone of the emergency and get them to Muster at their emergency or muster station

- The action to be taken by crew and passengers on hearing the General Emergency Alarm
- The Abandon Ship alarm
- Other emergency signals and action to be taken, e.g. Man Overboard
- Special Instructions — detailing particular crew responsibilities

Copies of the Emergency Muster List must be placed in highly visible places around the ship including the bridge, engine room and accommodation spaces.

By mustering crew and passengers in designated places in the vessel we can account for everyone, have crew members' best placed to deal with the emergency and keep people clear of firefighting and damage control teams.

Drills to exercise the ship's emergency response are regularly undertaken in accordance with company/vessel requirements to ensure all are familiar with what to do and are well practiced in emergency procedures and equipment. As a crew member you must be fully competent and confident of your role in any emergency. Your uniform will identify you to passengers as someone they can turn to for guidance in an emergency so it is important that you can respond in a fully professional manner.

Emergency Signals

The General Emergency Signal is used to alert all on-board to an emergency incident and to initiate the movement of all personnel to their emergency and muster stations.

The internationally agreed General Emergency Signal Consists of seven or more short blasts followed by one long blast sounded by bell, siren or horn.

7 or more short blasts on the ship's whistle and General Alarm bell, followed by one prolonged blast



It in an emergency the situation on-board becomes so hazardous that the Master/Kaihautu/skipper determines that personnel would be safer in life rafts or boats rather than staying on-board he will make the decision to Abandon Ship. This is a very serious

decision and only the Master/Kaihautu/skipper can order the Abandon Ship signal. On hearing this signal all personnel should proceed to their life raft stations.

The internationally agreed signal for Abandon Ship is repeated short and long blasts on bell, siren or horn followed by the message "Abandon Ship" over the PA system.






While the above signals are internationally agreed some vessels will establish their own particular general emergency and abandon ship alarms. Ships may also have alarm signals for other emergencies such as man overboard.

Horn

A horn is used to signal vessels intentions and alert other vessels in low visibility. Main sound signals are:

- 1 short blast – turning to Starboard
- 2 short blasts – turning to Port
- 3 short blasts – going astern
- 5 short blasts – draw the attention of the other vessel that they have to give way

Fog signals are: Sounded at intervals of no longer than once every two minutes

	Vessel under power
	Under sail, fishing, trawling, restricted in ability to manoeuvre, towing, constrained by draft
	underway but not making way
	Last vessel in tow
	Pilot vessel

Long blast: 4-6 seconds. Short blast 1 second. All repeated at least every 2 mins

Fire and Emergency

Continuous ringing of the General Alarm bell for 10 seconds and continuous sounding of the ship's whistle for 10 seconds



Abandon Ship

7 or more short blasts on the ship's whistle and General Alarm bell, followed by one prolonged blast



Man Overboard	3 prolonged blasts on the ship's whistle and General Alarm bell ████ █████ █████
Dismissal from Drill	3 short blasts on the ship's whistle and General Alarm bell ●●●

Bell

The bell is a piece of traditional equipment that you will not find on modern vessels, as it has been replaced by the horn. However, it can still be used to sound signals. It should also be used in an emergency to attract attention. The bell on the *Aotearoa One* is on the forward side of the Whare/Cabin.

FIRE

On-board a ship, fire is a particular hazard because you cannot distance yourself from it and there is no fire brigade to fight it for you. With a ship fire you will have to stay and fight it yourself.

Continuous ringing of the General Alarm bell for 10 seconds and continuous sounding of the ship's whistle for 10 seconds



Prevention as with most things, prevention is better than cure so in the operation of vessels we try to minimize the possibility of fire breaking out. Good housekeeping is a key strategy in fire prevention. Keeping a ship clean and tidy will make it more difficult for fire to gain a foothold. Keeping equipment well maintained and properly isolating hot components from flammable materials will also assist in preventing fires starting. However, even in the best maintained vessels, fires can still break out so we must remain constantly vigilant.

Fire Fighting

For a fire to burn it needs three key ingredients namely fuel, heat and oxygen. These three ingredients are known as the fire triangle. If we remove any of these elements from the triangle then the fire will go out. Thus the basic principle of firefighting is to break the fire triangle which can be done by starving it of fuel, smothering it by excluding oxygen or cooling

it below ignition point. Most firefighting appliances work by cooling or smothering, with fuel removal or isolation being affected by the crew.

In areas particularly susceptible to fire, such as engines rooms, many vessels have fixed firefighting systems that can be automatically or remotely activated should fire break out.

Portable fire extinguishers are 'First-aid' firefighting equipment; they have a limited duration of discharge, and are only for tackling small fires. These extinguishers come in a range of types according to the class of fire that needs to be dealt with. It is vital that you can match the correct extinguisher to the fire you need to put out. Choosing the wrong extinguisher could cost you your life. It is also important that you know how that the extinguisher will not last very long until discharged. Fast efficient use is critical.

Discovering a Fire

It is very important that you know what to do if you discover a fire or detect smoke on-board because your initial actions may have a significant impact on the fire's development and the damage it does. Have a look in your MTOP for details of the action to be taken. Amongst the initial actions taken will be:

Raise the Alarm — shout or set off an alarm to let everyone know a fire has broken out.

Fight the fire — if possible fight the fire with first aid appliances to extinguish it as quickly as possible.

Contain the fire — close access doors/ports to the fire to stop its spread and to starve it of air

Fire Equipment

Fire Hose

The engine supplies sea water for the fire hose. The nozzle on the hose can change the discharge from a narrow stream to a wide dispersing spray

Fire Extinguisher

A number of fire extinguishers are located in different spots around the vessel. They are not all the same type.

There are three types of fire extinguishers

- *ABE Dry Powder* – used on wood, paper, textiles, flammable liquids, electrical and gas fires.
- *Foam (AFFF)* – used on paper, wood, textiles, flammable liquids.
- *Multi-Purpose Dry Power* – used on all classes of fire.

There will always be a sign next to the extinguisher stating its type and what type of fire it is for.



Fire Bucket

The most basic type of firefighting equipment found on Maritime Museum vessels. Each bucket will have a line attached.

By holding one end of the line you can drop the bucket into the sea, then pull it up full of water and tip the water on the fire.

Fire Blanket

It consists of a sheet of fire retardant material which is placed over a fire in order to smother the fire. Fire blankets are also used to wrap around a person on fire.

The fire blanket is folded into a quick-release container for ease of storage.

Fire Axe

The fire axe can be used to cut away burning ropes and sails; also it can be used to free people if there is a rigging failure.



Abandoning Ship

If an emergency on your vessel becomes so serious that evacuation to lifeboats or life rafts is a safer option than remaining on-board the Master/Kaihautu/skipper will order “Abandon Ship”.

This is a serious decision and will only be made in extreme circumstances.

As a crew member you must be prepared to take on a leadership role when abandoning ship particularly if you have passengers on-board who will be looking to you for expert guidance. In order to provide this guidance it is vital that you know exactly what to do, where to go and how to use any necessary emergency equipment. It is also vital that you remain calm and reassuring in circumstances that may be very stressful. Being knowledgeable and confident in the procedures and equipment will assist you in this.

7 or more short blasts on the ship's whistle and General Alarm bell, followed by one prolonged blast



Some passengers, such as children, the elderly, disabled or injured may need greater assistance than others. Be ready to render this extra assistance or utilize more able passengers to assist which can be very positive for the whole group. Be alert for the deaf who may show no outward sign of disability and also for people who show signs of starting to panic. It is important to nip panic in the bud by being calm and reassuring.

While circumstances may sometimes require the urgent abandonment of a vessel usually there will be some warning and you may have an opportunity to gather some items that will assist your survival in the lifeboat/raft. Such items as blankets, water, medicines, food and hand held radios can all be placed in a "grab bag" and taken with you. A Mobile Phone should be placed in a waterproof bag.

If a ship's crew are confident and well-practiced in their vessels abandon ship procedure they should be able to conduct it calmly and efficiently with minimal risk.

Hand Signals

Hand signals are often a very effective means of communicating simple instructions. They are particularly useful for deck operations where distance or external noise can make verbal communication difficult. While there are established standardized codes of hand signals for certain operations such as crane work, vessels often develop their own set of signals to suit the operations they regularly carry out. It is your responsibility to know the hand signals that

are used on your vessel. Some examples of hand signals are shown below.

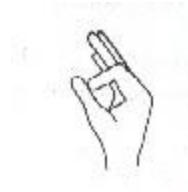
Stop



Slow Down



Okay



Yes



No



Come to me



Commands

In many cases there may be two commands (or orders) that mean the same thing. Just as volunteers come from different backgrounds, the Master/Kaihautus also come from different marine backgrounds. We have Master/Kaihautus who commanded tankers, container ships and bulk carriers. Others who have been Master/Kaihautu of small vessels like fishing boats and ferries. Different types of vessels have different sets of commands depending on job.

The commands listed below are some universal commands that are used in most marine industries.

Let Go Means to release the line from the cleat or belaying pin. The command will be followed by the name of the line to be released, e.g. Let Go Bow Line. The Let Go command is commonly heard when the mooring lines are released

Make Fast	Means to secure the line to the cleat or belaying pin. The command can be followed by the name of a line to be made fast, but when no name is given the command means for all lines are to be made fast. The following commands mean the same thing; Secure, Belay, Tie Off.
Stand By	Means the crew should prepare to do a task. The type of task will follow the command. The most common Stand By commands are: Stand By to tack, Stand By to Gybe and Stand By to Hoist.
Avast	Means to stop what you are doing.
Haul	Means to pull on a line. Generally the name of the line will follow the command. Also stated as: Haul Away.
Ease	Means to let out a line. Generally the name of the line will follow the command. Also stated as: Ease Out.
Lee Oh	Means the vessel is turning into the wind for a tack.
Gybe Oh	Means the vessel is turning away from the wind in a gybe.
Rounding Up	Means the vessel is turning into the wind for the purpose of lowering the sails.
Sheet Home	Means to haul in the sheets to the centreline.
Take a Turn	Means to put one figure eight turn on a cleat or pin. The command can be followed by the name of a line for the turn to be taken on.

As you work alongside other crew members you will pick up on the other commands used, but as long as you understand the commands listed above you will be able to follow the basic commands given.