

Trainee Crew

Module 1: General Safety



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1 Learning outcomes

By the end of this module, you will:

- Understand the concept of safety - with regard to actions, duties and behaviours.
- Know about the personal protective equipment, and safety when working with ropes and equipment on board rescue vessels.
- Understand the procedures to conduct water rescues, and to be safe when going into the water.
- Understand the duties of the lookout and the procedure to follow in a man overboard (MOB) situation as a crewperson.
- Know the International Distress Signals.
- Know the concept of duty towards the Rescue Base.

2 Introduction

Developing a culture of safety within the NSRI cannot be over-emphasised. This is achieved by always adhering to safe working practices and carrying out the correct procedures as laid down by the standard operating procedures (SOP's) and in your training. Whenever in doubt - ask your Coxswain.

Rules and regulations are there for a reason. Always obey them. Learn to find the reasoning behind them, and share them with your fellow trainees. Report near misses and accidents - it is the only way everyone can learn from mistakes and improve working techniques.



Figure 1: Safe working practices

2.1 Do not

- Smoke on board without the Coxswain's permission.
- Smoke or bring a naked flame near the craft when refuelling or charging batteries.
- Allow a rope to run rapidly through your bare hands. This can cause **Rope Burn**.
- Wrap rope around your wrist in order to get a better grip - it will not release quick enough if needed, causing injury, or pulling you overboard[R1].[BA2]
- Handle a wire rope without gloves being worn (a broken wire in the strand could impale your hand).
- Hold the nozzle of a discharging CO₂ fire extinguisher - it can freeze, causing **Freeze Burn**.
- Touch any part of the antenna of a MF/HF radio installation. This can cause **Radiation Burn** - due to the emission of microwave energy. Do not stand near the antenna if transmitting is possible.
- Wear loose fitted clothing (sleeves, ties, and belts) near turning sheaves or moving machinery (fan belts, fly wheels, shafts, etc.). Keep long hair tied back and away.

2.2 Do

- Always have one hand for the boat and one hand for yourself to support you. If you require both hands for a task, sit down on the deck, or have your buddy support you.
- Always be prepared for worse weather conditions than when you launch. (Always have all your kit on board).
- Wear a safety harness when on deck (Class 1 vessels) during inclement weather.
- Ensure that the "Kill Switches" on the O/B motors are tested, rigged and attached.
- Learn to develop "Global Awareness". This means being aware of the surroundings, whilst still doing a task (e.g. focused on setting up a tow, but still being aware of the swell, and what other crew are doing at the same time, among other things).
- Work with, or lift, equipment/casualties on deck using your knees and legs - not your back. Keep your back in a straight position to prevent injury.





Video 1: Kill switches

2.3 Buddy system

When out at sea as part of a crew, pair up with another crewman to assist each other in any task you may have, to support each other in a rough sea and to watch out for each other if you get into difficulty.

3 Limbs over-side

A crewperson on a fast rescue boat travelling at speeds of up to 35 knots (64 km per hour) must either be sitting or standing in a secure position making use of foot straps and/or hand holds to brace themselves against any severe and unexpected movements when at sea.

Learn to expect the unexpected.

Any person sitting on the pontoons or deck edge with legs over the side will not fulfil this requirement. Even at lower speeds, legs hanging in the water as the vessel rolls or makes a turn will experience considerable drag - possibly enough to pull the person over the side, especially if they are caught unaware with no proper handhold.

Never use your limbs as a fender between the vessel and the quay or another vessel - they will be crushed!



4 PPE – personal protective equipment



Figure 2: Various protective equipment

NSRI crews are provided with PPE to keep them safe and warm. It identifies you as NSRI crew, instilling confidence in yourself, as well as those you are going to rescue. Like any PPE, it needs to be worn properly to work properly, and used correctly to be fully effective. PPE is bulky and uncomfortable at first, but with time - this gets better and the benefits outweigh the negatives.

A big part of what we try to achieve as Sea Rescue is to set an example to the general boating public as to water safety. This is why we wear lifejackets on the water at all times.

4.1 Lifejackets

NSRI have two styles of lifejacket: auto-inflate and foam-filled. Class 1 vessels have auto-inflate lifejackets, whereas smaller vessels have foam filledjackets (120 - 150N buoyancy).

Auto-inflate lifejackets will inflate when in the water and have 150N of buoyancy. Once inflated, there is a mouthpiece for manual inflating and, in some lifejackets, a spray hood.

Spray Hoods:

- Prevent inhalation of spray, particularly as hypothermia sets in.
- Reduce heat loss from head.
- Greatly increase survival time.

Crotch Straps:

- Prevent lifejacket from riding up.
- Must be adjusted properly to be able to swim effectively (test by lifting arms up first).





Video 2: Lifejacket test

AIS MOB units:

Most of our lifejackets have AIS MOB devices that send out an AIS position signal when activated. This enables local AIS receivers to identify your position, to take the search out of your rescue.



Figure 3: The AIS MOB device

Light:

- Lifejackets are fitted with lights so that in the event of being in the water at night, or in a MOB situation, you are more visible.

Whistle:

- This can be used to attract attention when out at sea. Note that when you become hypothermic, it will be difficult to shout, so a whistle is important.

4.2 Wetsuit

These provide thermal aid when in the water (heat loss is 22 times faster in water than in air). It also provides some insulation to bumps and scrapes when on rocks, or on the vessel. They provide sun protection too.

Booties / footwear:

- Often casualty vessels or rescue locations are hazardous places, (broken glass, sharp rocks, and barnacles). Ensure to have the correct foot protection to avoid injury.

Medical Gloves:

- Get into the habit of having medical gloves in a wetsuit / lifejacket pocket, so they are at hand when you need to use them.

Knife:

- Any good crewman is suggested to have a personal knife with them. Ensure to keep it sharp and ready for use, e.g. for cutting lines in an emergency.



5 Ropes

When working with any ropes always take care not to place your hand between the rope and a bollard/cleat/post. A seemingly slack rope can suddenly become tight should the vessels surge. Do not get your fingers caught in the loops of a rope when tying knots.



Figure 4: The image on the left is the correct way to hold a rope; the image on the right is the incorrect way to hold a rope

Remember that ropes can part violently when under tension. Learn to expect it, as it is the best way to prevent it from injuring you, or someone else.



Figure 5: Tension on the rope

5.1 Cleanliness / vessel housekeeping

Always ensure that the decks and gangways are kept clean. It is very easy to slip on a greasy or oily patch. Oil or grease can be brought on board on shoes, from a mooring rope that has been recovered from the water, or from careless refueling.

Every piece of equipment on the vessel has a home.

It is the responsibility of the crew (under the direction of the Coxswain) to keep the deck clear of equipment at all times. Loose, uncoiled ropes can wash overboard or float on a wet deck through the scuppers into the propellers. In a rough sea or in the surf this can lead to disaster. The small things count. Make it a habit of keeping the decks clear and returning equipment back to its location directly after use, ready to go again.



Figure 6: Ensure ropes are coiled to avoid them from washing overboard

6 Swimmers in the water and in-water rescues

6.1 RETHROG

A mnemonic to help you remember the order of how to rescue someone effectively:

Reach - Throw - Row - Go

In that order!

6.1.1 Reach (if close), Throw (if far)

This is the best type of rescue, as the rescuer has the least amount of risk. The rescuer should always consider the dangers of swift water, canals, rip currents, rocky coastlines, contaminated waterways, cold exposure, hazardous marine life, etc.

This rescue technique is used where there is a high risk of entering the water, and time or access may be too limited to get a water craft.

This is important in terms of public education as many people drown in pools, while bystanders who cannot swim, also think they cannot help, even though there is a pool cleaning pole hanging on the wall alongside. People often panic in water in which they can stand up in, so by encouraging them to just stand up can help too.

You should be well practiced in the skill of using a throw bag/rope, which enables you to aid someone relatively near, without the risk of entering the water.



Figure 7: Examples of reach and throw

6.1.2 Row (if further than a throw bag can reach)

This is the next safest option (but still risky), as the rescuer has to go onto the water, but takes a substantial buoyancy and propulsion aid with. This can take the form of body/surf board, kayak, paddle ski, raft, motor boat.

It is critical that one is relatively proficient in the use of the craft that they are using. For example, using a kayak in swift water or surf takes a lot of skill and stamina on its own, let alone trying to affect a rescue.

6.1.3 Go (if one absolutely must enter the water)

This is the category that 'surf lifesaving' falls into most of the time. It is the most popular and glamorous, and possibly the most noticed of rescues. This happens when all other options (and hazards) are weighed and time or access makes them impossible. The rescuer is left with two choices (both of which may be the right one):

1. After considering hazards - decide not to affect a rescue, as the risks would probably mean that there would be more victims added by attempting to go in; or
2. Go. Get in the water. However before just jumping in 'Baywatch Style', there are a lot of things you can do to make your rescue more successful and much safer. **Exposure protection** for cold water and rocks, (wetsuit); **buoyancy** - torpedo buoy or other buoyancy aid for victim; **Propulsion** - fins. (Also consider a helmet, mask, knife, swimmer's line and cow tail, etc.)

Also one can assign spotters to look for the victim you are attempting to rescue and get bystanders to call for further assistance, while you are busy.

6.2 Victim psychology

Victims who find themselves in a situation in the water want one thing only: to get themselves as far out of the water as possible. You can observe this if you are ever at a poolside with people who are not comfortable in the water: they don't just hang in the water, but attempt to have the top half of their chest out as well - straining while they do so.

When a victim sees you approaching, and if they are in an active state of panic, they see you not as a human, but as a platform to get away from the water. They would use their own mother as a platform at this stage as all reason has left them.

By you going under the water - you are in a safe place, because they will not follow you there. Once you have a firm control of the victim in the water, you will find they calm down and trust you, but it is critical that you do not allow water to get into their airway, as that will begin another panic.

6.3 In water rescue techniques

Always use a torpedo buoy when proceeding to the assistance of a person in the water. This is attached to you with a strop that fits over one shoulder and across the chest. The casualty should be re-assured verbally and given the torpedo buoy to hold with both hands. The swimmer can then tow the casualty to safety with the casualty kicking to assist.

If assisting a swimmer without using the torpedo buoy, approach with great caution, as a panicked swimmer in trouble can be very dangerous. Talk to the casualty and reassure him/her and explain what your intentions are.



When taking a casualty aboard out of the water, the best place to board the craft will depend on its size and prevailing conditions. The bow is not the best place for this, and the stern on the rigid inflatable and smaller craft is dangerous due to the proximity of the propellers. On these craft the best place will be amidships and far enough forward to ensure the casualty's legs, which tend to drift under the craft, are safe.

The larger craft have transom platforms over the stern and in this case the propellers are well forward under the counter. Even with low freeboard craft, it is very difficult to board from the water, even in the case of a swimmer who is mobile. In this instance, a bight (loop) of rope secured over the side can make a useful step.

Always try to bring the casualty aboard in a horizontal position, making use of a Stokes Basket, Trauma Board, or any other means available if spinal injury or hypothermia is suspected.

7 Duties of a lookout

Being a lookout happens at three distinct stages:

1. When underway at sea generally.
2. When at anchor during anchor watch.
3. When conducting a search for a missing person/vessel.

It is a legal requirement for all vessels at sea to keep a proper visual lookout at **all times**. The lookout shall methodically sweep the horizon, and bring to the attention of the helmsman or coxswain any object or sighting that could affect the safety of the vessel or be associated with the SAR operation.

When doing a specific search - the lookouts should be allocated a 30-45° "sector" to search, rather than an entire side, for more focused searching. Such sightings must be reported in terms of degrees on the relative bow, and the eyes must never be taken "off the spot" until the bearing has been taken.

The terms "red" and "green", corresponding to the colour of the navigation lights, can also be used to indicate on what side of the bow the sighting has taken place. Another system that can be used is the clock system - with 12 o'clock being dead ahead, and 6 o'clock being aft. The corresponding time is the direction that should be searched.



When handing over the lookout, the new lookout should be given a period of at least 10 minutes for the eyes to accustom themselves to full darkness. When binoculars are being used, the "sweep" must be taken very slowly because they have a very narrow field of vision, and time must be allowed for small objects to come into view from between the troughs of large swells.

When at anchor, two transit bearings should be taken at approximately 90° and regularly checked to make sure the anchor is holding. In addition, an alarm can be set on the GPS, so that if the vessel drifts out of a particular zone, it will sound.

7.1 Man overboard

By using the "Buddy system" at sea will help prevent any member of the crew from falling overboard, such as when a seasick person is leaning over the side to vomit.

- If you should see someone falling overboard, or should you observe someone in the water, shout "MAN OVERBOARD" and state which side. DO NOT TAKE YOUR EYES OFF THAT PERSON - NOT EVEN MOMENTARILY. Point in the direction of the MOB.
- It is very easy to lose sight of someone in the water, especially if the sea is rough.
- Mark the position of the casualty with a life ring preferably with a self-igniting light.
- Some vessels have a Dan Buoy or life ring on the bulwarks/rails for this purpose. If this is not at hand, then a lifejacket or a fender or anything else that floats will do.
- At night, the searchlight must be used to mark the MOB and/or the marker, and all available eyes assist in watching.
- Push the "Man Overboard" (MOB) facility on the GPS to record the position.
- Where the casualty is lost to sight, lookouts should be posted as high up as possible, and at night, every possible light should be used, and white illuminating parachute flares released to assist observation.
- Depending on the amount of lookouts, the area around the vessel should be divided into sectors and each sector allocated to a lookout.
- During the search, all on-board noise must be kept to a minimum, and ears made available for listening to whistle sounds. Consider turning off the engines to make listening easier, if conditions allow.
- Watch the GPS display screen to see if the AIS MOB signal is activated by the MOB, giving the position (if AIS fitted to the boat, and if the lifejackets are equipped with AIS MOB's).





Figure 8: GPS displaying an activated AIS MOB signal

- Prepare to treat the casualty for injury/hypothermia (ensure to recover horizontally to prevent hydrostatic squeeze release issues and handle casualty gently).

International distress signals:

- A gun or other explosive signal fired at intervals of about a minute.
- A continuous sounding of a horn.
- Rockets or shells, throwing red stars fired one at a time at short intervals.
- Signal: ... ----- (S.O.S.). Made by any signalling method.
- The spoken word "Mayday" sent by Radio
- The International Flag Code Signal of distress indicated by "NC".
- A signal consisting of a square flag having above or below it a ball or anything resembling a ball.
- A black square and ball on any background
- Flames on the vessel (as from a burning oil barrel, etc.).
- A rocket parachute flare or a hand flare showing a red light.
- A smoke signal giving off orange coloured smoke.

- Slowly and repeatedly raising and lowering arms outstretched to each side.
- The radiotelegraph alarm signal.
- The radiotelephone signal.
- Signals transmitted by emergency position-indicating radio beacons.
- Approved signals transmitted by radio communication systems (i.e. GMDSS).

8 Rescue bases

Crew have a duty not only towards the rescue boats, but to the station as well. Station fittings and equipment require regular maintenance and cleaning along with the vehicle and boat trailers. Major items such as shed doors, boat cradle, winch and winch wires will require regular lubrication, and there will be many smaller items that will need lubrication and protection from the corrosive maritime environment in which they are located.

You should familiarise yourself with the following:

- Security - Where are keys kept? What is the locking up procedure? Is there an alarm system?
- Firefighting equipment - Where the fire extinguishers are situated and the types of fire they can be used on. (Fire hoses, fire mains and axes).
- The main electrical distribution board and the various circuits supplying the base.
- The position of the main stopcock of the water supply.
- Where various items of equipment / tools are stored.
- Where flammable items such as fuel, oils, paints & cleaning material are stowed & disposed of.
- Do not operate or attempt to operate any equipment that you are not authorised to operate (i.e. winches/tractors/vehicles).
- Study the SOPS and Checklists. The process of doing the checklists makes you familiar with the location of all the equipment, so that even when you are out on a dark, rough night at sea - you know instinctively where the equipment is, and how to use it.

