BSAC
Safe Diving

Your guide to the safe practice of
sports diving as recommended

by

the British Sub-Aqua Club

Revised September 2017

Introduction

Diving is a potentially dangerous sport with a good safety record. It is impossible to remove the risk completely but proper equipment, training, being “dived-up”, experience, self-awareness, and a safety-conscious attitude all reduce the risk of a serious incident.

Diving is, for many, an adventure sport and like all adventure sports its participants enjoy different levels of adventure. At one extreme we have the equivalent of the high-altitude mountaineer who accepts the challenge and unavoidable risks of new routes and exploration in remote places. At the other extreme we have the equivalent of the rambler who strolls along well-marked country paths in good weather.

Safe Diving contains recommendations and guidance to help divers reduce the risks. These recommendations are not a set of rigid rules, but can be amended depending on the circumstances of the dive and the skills and experience of the divers involved.

Most BSAC members are not paid to dive. However we hope that this document improves the safety of all divers, whether paid or unpaid. Divers working for hire or reward in the UK will also need to consider the Diving at Work regulations and relevant Approved Code of Practice issued by the HSE.

Many of the risks addressed by these recommendations relate to how to avoid potential personal injury or death. However even with the best preparation accidents can occur, consequently divers may face the risk that their actions may lead to them facing civil or criminal legal action. Facing legal action of any kind can be a deeply distressing experience, and can lead to devastating financial and personal consequences for those involved. For this reason this document includes recommendations about legislation, insurance, dive organisation, and taking responsibility for others.

The Diver's Code of Conduct is provided at the end of this document. It contains sensible advice on the responsible conduct of all dives, and is complementary to the guidance given here.

On the BSAC website there is a summary table showing the responsibilities of the Diving Officer, Dive Manager, and divers on a trip (see **bsac.com/divedefinitions**).

Going diving..... 8

- Access/egress (entries and exits)
- Breathing
- Buddy checks
- Buddy diving
- Building experience
- Build-up dives
- Buoyancy and trim
- Cave diving
- Deeper diving
- Depth limits
- Diving in a three (or more)
- Diving with an unfamiliar buddy
- Hyperventilation
- Lines, ropes and nets
- Low visibility
- Night diving
- No clear surface
- Panic
- Recall
- Separation
- Shotlines
- Signals
- Technical diving (definition)
- Wreck diving (also see Legislation and The Divers' Code)

Policies of BSAC

All BSAC policies can be found on **bsac.com/policies**

Going diving

Access/egress (entries and exits)

- Before diving, ensure that you will be able to get into the water and climb out again safely with your diving equipment.
- Remember that weather and tides can change while you are underwater, potentially affecting your planned exit point and possibly making it harder to exit the water.
- Ensure you can successfully regain contact with, and recover, your boat.

Breathing

- You should always breathe normally throughout your dive.
- Never hold your breath, especially when ascending. If you do so, you might suffer damage to your lungs.
- You should not “skip breathe”. Skip breathing is when you inhale, then hold the breath in for a while, before exhaling. Skip breathing can lead to a build-up of carbon dioxide in your lungs.
- If you are breathing quickly, it could be a sign that something is wrong. You should try to regain control of the dive and your breathing. If possible stop (after signalling your buddy) and take a moment or two to regain control.

- If, after stopping, you cannot regain control of your breathing, it could be a sign that you are suffering from a serious problem such as a carbon dioxide toxicity incident/problem or immersion pulmonary oedema. If you cannot regain control you should abort the dive.

Buddy checks

- A buddy check is an equipment check that you perform with your buddy immediately before entering the water. These checks help ensure that you understand your buddy's equipment configuration and they understand yours, and that both sets of kit are functioning correctly. BSAC recommends that all divers conduct a buddy check before every dive.
- As well as checking your kit you should check that you have enough gas for the dive, and that any cylinders are switched on as appropriate.
- You should also confirm with your buddy what you expect them to do in an out of gas situation. If you are diving a rebreather or a primary donate configuration, a dry run before the buddy check is advisable as a buddy check is not the time to be explaining the out of gas response for the first time.
- It's also a good idea to tell your buddy whether you plan on using your buoyancy compensator (BC) or drysuit for buoyancy, in case they need to lift you to the surface.

Buddy diving

- BSAC trains divers to be self-reliant. This means that you are trained to manage all parts of the dive yourself, and to resolve the problems that might occur.
- BSAC recommends that you dive with a buddy. Buddy diving means that divers operate as a unit, with each diver taking some responsibility for the safety of the other(s).
- Before every dive everyone should be clear who is going to lead the dive, and how you will be positioned underwater.
- Trainees without a diving qualification should be led by an Instructor (or an Assistant Instructor under supervision) on training dives. They can be led by a Dive Leader or above on non-training dives.
- When snorkelling, you should take turns to dive so that one snorkelling buddy is on the surface at all times.
- BSAC does not provide training for, or support, solo diving, but does train and encourage divers to be self-reliant.
- There are occasions, for example, in nil visibility or when working underwater, when the 'buddy' system is ineffective. On these occasions a solo dive may be required, with the diver being securely roped and in constant rope communication with a surface 'tender', who should be a diver themselves. The rope must be securely fastened to a suitable object

on the surface. Communication signals must be fully understood and a fully kitted, roped, 'stand-by' diver must be immediately available to dive in the event of an emergency

Building experience

- As well as formal lessons, building experience is an important part of the Diver Training Programme.
- The learning process does not stop once you have gained your qualification. You will continue to develop and consolidate your skills through regular use and practice.
- BSAC recommends that after gaining a new qualification, you build up your experience progressively by practising those skills with more experienced divers, or your peers.

Build-up dives

- If you have not dived for a while, BSAC recommends you do some build-up dives to help make sure you're "dived up".
- Similarly if you have not dived to a particular depth for a while, then you should do a series of build-up dives to prepare you for diving at depth again.
- Any skills not regularly used will deteriorate over time. Due to the good safety record of diving rescue skills are rarely required to be performed for real. If you have not practised rescue skills for a while, then

you should think about practising these skills in a controlled environment.

- Similarly if you dive a rebreather, you should periodically practise bailout ascents to make sure your skills don't degrade over time.
- It can take time to get used to changes in your kit configuration, and sometimes they can be a bit unsettling. Therefore, if you change a piece of your equipment, or add something new, or rearrange your existing configuration, BSAC suggests you try it out in a controlled environment before using it on a more challenging dive. Try to limit changes to one at a time.

Buoyancy and trim

- Good buoyancy control makes your diving more efficient with the benefit that it is both safer and more enjoyable.
- You should be able to maintain neutral buoyancy at all points during the dive.
- During decompression stops, you should aim not to vary your depth by more than +/- 0.5m (for example, a 6m stop should be within 5.5m and 6.5m).
- You should be competent and confident at managing emergencies, including faulty inflation valves, drysuit inversions and controlled buoyant lifts.
- During a dive, you will need to adjust your buoyancy to compensate for buoyancy changes due to

changes in pressure. This can be done either through adjusting the amount of gas in your drysuit or in your BC.

- When underwater, BSAC recommends that you should use either the drysuit or your BC for primary control of your buoyancy, but not both at the same time.
- A drysuit is not a good method for providing positive buoyancy on the surface, and so BSAC recommends that you wear a BC on every dive.
- Make sure that you choose the correct size BC. This means that not only does the harness fit you well, but that the buoyancy cell is neither too large nor too small for the rest of your kit. If you use a wing-style BC and it is too large, it can wrap around your cylinder(s) and make it very hard to vent all the gas, potentially causing an uncontrolled ascent.
- Practice makes perfect.

Cave diving

- Requires specialist training and is not covered within BSAC training.
- BSAC recommends that if you want to go cave diving, you do formal training beforehand. The Cave Diving Group can advise on cave diving in the UK.

Deeper diving

- If you are planning a deeper dive you should carefully consider the potential hazards and whether the level of risk is acceptable to you and your buddy. In particular you should consider the following risks (many of which are covered in greater detail elsewhere in Safe Diving):
  - **Narcosis**
    As you dive deeper, the effects of narcosis increase, becoming increasingly noticeable beyond 30m when diving on air. You can reduce this risk by using trimix when diving deep.
  - **Decompression obligations**
    Deeper dives often require decompression stops. You should make sure that you are well-prepared (both mentally and with the right equipment) for these stops.
  - **Oxygen toxicity**
    Deeper dives increase the partial pressure of oxygen within a breathing gas mix towards toxic levels. Deeper dives should be carefully planned to account for this increased risk (see **Oxygen toxicity**)
  - **Gas density**
    As you dive deeper, the density of the gas you are breathing increases. This has implications for how much physical effort it takes to breathe (see **Work of breathing**). You can reduce this risk by using trimix when diving deep, and by avoiding situations that cause you to breathe heavily (such as swimming into a current).

– **The surface (and help) is further away**
  This means that it will take longer to reach the surface and you will need more gas. Consideration must be given to the need to resolve problems underwater while accounting for the time to ascend and the implication of any required decompression stops.
– **More complex equipment**
  Often you will need more complex equipment to dive deep, including a fully redundant gas supply. This can mean that there are more things to go wrong and diving with unfamiliar equipment can cause problems itself. You can reduce this risk by making sure you are familiar with any new equipment before the dive and practising regularly.
– **Longer dives**
  As you dive deeper, you may choose to do dives that require lengthy decompression stops. The increased time in the water can bring on physiological stresses. For example you may need to think about how you will stay warm and hydrated.
– **Psychological stress**
  You may find that deeper dives are more stressful mentally, especially if you are not used to diving to a particular depth. This stress can be exacerbated by cold water, complex equipment, poor visibility, and other factors.

Depth limits

- Divers should adhere to the depth limits set by their qualifications. Extending such depth limits should only be undertaken after gaining further relevant qualifications.
- Different breathing gases may impose different depth limitations due to the risks associated with the component gases and these must be adhered to.
- BSAC recommends a maximum depth limit for diving using air of 50m.
- In an emergency, before carrying out a rescue consideration should be given to personal safety of the rescuer/s as well as their ability to do the rescue.
- BSAC recommends a maximum depth of 100m when using helium-based mixed gases by suitably trained and qualified divers.

Diving in a three (or more)

- Diving in buddy pairs is preferable to diving in a three or more.
- A key issue in diving with three people or more is the distraction factor, which can affect either the identification of a developing problem or its subsequent resolution. The task loading when diving in threes is increased and requires that all three divers are capable of coping.
- Trio diving is not for the inexperienced or those unfamiliar with each other.

- Trio diving requires serious consideration by the Dive Manager to ensure that divers with the appropriate level of skill and reliability are grouped together.
- A dive plan understood and agreed by all divers prior to entering the water is essential.
- It should also be understood and agreed beforehand that the Dive Leader's decisions and directions will be adhered to.
- All three divers should consciously and conscientiously monitor both of their buddies.
- You should think carefully about how you will position yourself relative to each other.
- It is recommended that all divers should be equipped to be as self-sufficient as possible; each should have an adequate, completely independent bail-out gas supply; each should carry, and be able to deploy unassisted, a delayed surface marker buoy (DSMB).
- Training dives can involve groups larger than buddy pairs and for teaching some skills, for example controlled buoyant, lift this may even be necessary and requires separate consideration. Where appropriate it may be prudent for instructors to be assisted by an experienced diver whose role is to act as safety monitor for both students and instructor.

Diving with an unfamiliar buddy

- Sometimes, for example on holiday, you might find yourself diving with a diver whom you have never met before. There are many excellent divers out there, however there is a risk you may find yourself paired with a buddy who has poor buddy skills, dreadful buoyancy or poor gas consumption. There is a lot you can do to reduce the risk of an accident.
- Before the dive you should talk to your new buddy about their diving experience.
  - What qualification do they hold?
  - How many dives have they done?
  - When was their last dive?
- Observe your new buddy.
  - The way someone puts their kit together tells you a lot about how comfortable and competent they may be as a diver.
  - Does your new buddy seem nervous?
- Talk through the dive beforehand.
  - Start with the descent; what will you do when you get to the bottom (for example some people like to pause for a couple of minutes to get their breath back).
  - Then move on to the dive itself. How will you position yourselves? What sort of things do you enjoy when diving? How will you communicate?
  - Talk through the ascent, including whether you will be ascending up a reef, DSMB, or shotline. How quickly do you like to ascend? Does your

computer ask you for deep stops? How long a safety stop will you do? Is it at 6m or 5m or 3m?

– Don't forget to explain how you will respond in an out of gas situation.

Hyperventilation

- When snorkelling or surface diving, BSAC recommends that you shouldn't hyperventilate before the dive. This is because hyperventilation lowers carbon dioxide levels in your blood, reducing the stimulus to breathe. This means that you could pass out from hypoxia (lack of oxygen) before the urge to surface becomes too great to ignore.

Lines, ropes and nets

- When diving you should be alert for entanglement hazards such as nets, ropes and lines underwater. This may include lost fishing gear or part of the equipment of a wreck. Other lines might have been laid intentionally by divers. BSAC recommends that you always carry a cutting device such as a knife or shears, and ideally two.
- Dedicated line cutters can be easier to use than a knife, especially for cutting thin line or a net. Whatever type of cutting device you carry, you should make sure it is sharp enough, and practice beforehand on dry land so that you know what it can do.
- If you are caught in lines or nets then you should

stop and remain calm. Do not twist about or try to turn around as this can make the tangle worse. Instead, you should signal to your buddy. It will often be easier for them to cut you out of the line.

- If your buddy does not respond to your distress signal, then keep calm. Think about inflating your BC slightly so that the line is taut and easier to cut.
- Try to avoid cutting line that looks like it might have been laid intentionally by other divers; they might be relying on it to (for example) get back to the shot.
- If you are laying line yourself, then make sure the line is kept taut at all times. You should secure it at regular intervals and at every change in direction. Make sure your line is secured close to the bottom, so that it's not a hazard to other divers.
- When laying line, don't let a loop of line form and float in the water where it might entangle you or others.

Low visibility

- You may need to swim more slowly and much closer to your buddy, or even hold hands or use touch to remain in contact.
- A good torch not only helps you see, but also helps your buddy see you. Consider carrying a spare.
- If the visibility is so bad that there is no ambient light (you cannot see the "green glow" above), then the risk of swimming into an overhead environment

without realising is higher. On sites where this is a possibility you can dive using a distance line, if you are competent to do so, anchored at your point of descent, to provide a route back to a known clear overhead.

Night diving

- You need to plan your dive carefully when night diving, especially in tidal waters.
- Being familiar with the site can help with navigation. Where possible explore the site during daylight before night diving.
- You and your buddy should have a minimum of one working torch each at all times. If your torch breaks, and you don't have a spare, you should terminate the dive.
- You should plan how you will exit the dive and how you will be seen on the surface.
- Avoid shining your torch in your buddy's eyes.
- Agree the signals you intend to use. Complex hand signals don't work as well in the dark, so think about whether torch signals are more appropriate.

No clear surface

- A no clear surface dive is one where you cannot make a direct return to the surface. Examples include cavern, ice and wreck dives, requiring mandatory decompression stops.

- Some diving with no clear surface requires different equipment, certain skills and techniques. You should make sure that you have appropriate formal training and equipment for the diving environment you are in.
- Lay a line, to provide a route back to the exit.
- Carry enough gas to get back to the exit point in an emergency situation.
- Diving under ice should only be undertaken with a surface party of at least two. This allows one to act as tender and one to manage any emergency. One of the divers should be securely roped to the surface and contact between the divers should be by means of a buddy line.
- Whether to go inside an overhead environment is ultimately a judgement call for you based on your own assessment of the hazards and your own assessment of your abilities, training, and experience.
- Similarly your buddy is responsible for making their own decision on whether to go inside an overhead environment. You should not pressure them to do something they are not comfortable doing. Nor should you be pressured yourself.

Panic

- The best solution to feeling panic is to prevent it from occurring in the first place. It is easier to resolve a small problem early on, before it has time

to turn into a major issue.

- Before the dive you should talk with your buddy, and explain if there are particular things, such as going inside a wreck, which make you nervous, and find out if there is anything they are apprehensive about. Be prepared to abort the dive any time you are not happy about it.
- Once on the dive, you should try to be self aware. If you are becoming nervous, understand the reasons why, and let your buddy know.
- Similarly, you should monitor your breathing rate. If you find yourself breathing hard, it could be a symptom that something is wrong. Stop (after signalling your buddy) and regain control of your breathing.
- As part of normal buddy diving, you should also be alert for signs of discomfort in your buddy.

Recall

- When divers need to be recalled to the surface there are several means available.
- A pre-arranged signal on the line of an surface market buoy (SMB) or DSMB may be sufficient. This can be achieved either by pulling on the line (four pulls is a widely recognised signal for the diver(s) to return to the surface) or by clipping a small karabiner to the line and allowing it to slide down the line to the diver; this karabiner could have a message or coloured tab attached.

- Thunderflashes can be purchased for use as diver recall signals.
  - Ensure they are of large enough size and that they are weighted, before you need them, so that they will sink before they explode.
  - Endeavour to allow divers to safely experience a thunderflash going off as a training drill so that they will recognise the sound when they experience it in a real situation.
  - Thunderflashes, like all pyrotechnic devices such as flares should be: stored, transported and operated in accordance with the manufacturer's instructions; not be used after their expiry date; and should be disposed of properly.
  - Divers are cautioned against taking explosive devices abroad, as they are certain to cause major concerns with travel security personnel.

Separation

- You should agree with your buddy what you will do if you become separated underwater.
- If you lose sight of your buddy remember that divers have a blind spot directly behind and above them, so look behind and above you first.
- If separated underwater, make a brief attempt (approx. 30 seconds) to re-locate your buddy, after which the divers should surface. Continue to look

around during the ascent.

- If you re-join your buddy either during the ascent or on the surface consider carefully your decompression requirements before you decide to re-descend. You will almost certainly be increasing your risk of Decompression Illness (DCI).

Shotlines

- As well as marking a dive site, a shotline provides a good visual reference, making descents and ascents easier and safer to monitor and control.
- You should not need to hang onto the shotline. Your buoyancy should be good enough that you can hold on with a couple of fingers. However, sometimes the current will be too strong and you will need to hold on more tightly.
- Avoid pulling yourself down on a line in a current as you could pull the shot away from the planned dive site.
- If you encounter other divers on a shotline, you should be courteous and polite, especially if they are inexperienced.

Signals

- Divers should be completely familiar with the standard code of visual signals and should give them accurately and clearly.
- If you are diving with an unfamiliar buddy, check you

use the same signals or understand any differences.

- All signals should be acknowledged.
- If using rope signals, all divers should have a clear understanding and be practiced in using them.
- If you need to communicate very complex information, you can always use a slate or underwater notebook.

Technical diving (definition)

- BSAC uses the term technical diving to encompass mixed gas diving involving the use of helium-based gas mixes and the use of rebreather systems.

Wreck diving
(also see **Legislation and The Divers' Code)**

- In poor visibility it is possible to go inside wrecks without realising. If this is the case you should think about laying a line (see **No clear surface**).
- Many wrecks are old and decaying, and full of silt, debris, and dangling cables. If you are not careful, you might cause a loose piece of metal to become dislodged or even collapse.
- Many wrecks have very sharp edges. You should be careful that you don't cut yourself or your equipment.
- Avoid excessive finning inside a wreck as sediment stirred up can be slow to settle, due to lack of tidal flow.

Gas

Bailout plans

- It is good practice to plan how you will surface safely if you lose a lot of gas from your cylinders during a dive, or if your rebreather fails underwater.
- Your bailout plan will depend on the dive. For simple dives on a single cylinder, your buddy could be your bailout plan. For very deep dives using multiple gases, your bailout plan will be much more complicated.
- You should write down complex bailout plans on a slate or waterproof notebook before the dive.
- For dives with long decompression stops, you should consider whether to have spare decompression gas available, for example attached to a decompression trapeze, or available as a “drop bottle”.
- If you are using a drop bottle, make sure that everyone on the boat, especially the skipper, knows the relevant signal and knows what they are expected to do when a drop bottle is called for.

Carbon dioxide

- The signs and symptoms of a carbon dioxide toxicity incident are not always obvious immediately, but if you find yourself breathing quickly, or feeling confused or panicked, then it may be that you are having a carbon dioxide problem. If you think that this is the case, you should stop (after signalling

your buddy) and try to regain control of your breathing. If you cannot regain control, switch to another gas source and abort the dive.

- You should be aware of the potential for carbon dioxide retention on deep dives. This is because, although you may not recognise it when you are relaxed and breathing easily, your body will have to work increasingly harder at depth, and you might not be able to ventilate your lungs adequately to get rid of all the carbon dioxide.
- You can minimise the risk of carbon dioxide retention by avoiding working hard underwater, breathing normally, and using well-maintained regulators and equipment. Breathing trimix instead of nitrox or air reduces the gas density and consequently work of breathing (see **Work of breathing**).

Compressors

- BSAC recommends that you should have formal training if you plan to operate a compressor.
- Take care when positioning the air intake. Do not put it in a place where there are lots of fumes or other potentially dangerous gases in the air.
- In particular, if your compressor has a petrol or diesel engine, make sure that the air intake is upwind of the engine exhaust.
- Make sure the air produced by your compressor meets the required purity standards. Air used for partial pressure blending of nitrox needs to meet

higher purity standards, and everything downstream of the final filter needs to be oxygen clean.

Diluent

- If you are diving a rebreather, you should plan carefully which diluent gas you use.
- Always analyse your gas before putting equipment together.
- If you have too high a percentage of oxygen, a diluent flush won't work very well if you need to reduce the partial pressure of oxygen quickly. However, if you are using a hypoxic diluent this increases the risk of hypoxia at shallower depths, especially if your rebreather is fitted with an automatic diluent valve (ADV).
- If you are diving deep, then you should think about using trimix as your diluent to reduce the effects of narcosis. BSAC suggests that you have an equivalent narcotic depth (END) of 30m, or less if you are undertaking a complex dive.

Gas density

- Increased gas density at depth means that it requires more energy to breathe at depth. This, together with other effects of depth means that it becomes increasingly difficult for your body to remove carbon dioxide.
- The effect starts to become increasing important for dives on nitrox or air below 30m, and poses

increased risk below 40m.

- You can reduce this effect by using trimix instead of air or nitrox.
- You can also reduce the risk by avoiding situations which could cause you to breathe hard at depth, such as swimming into a strong current.

Gas mixes

- You should have a suitable qualification if you plan to dive with a nitrox mix or trimix.
- Using a breathing gas with a high partial pressure of oxygen increases your risk of oxygen toxicity. You should not exceed a partial pressure of oxygen of 1.4 bar on the bottom phase of the dive, or 1.6 bar while on decompression stops (when you will be at a shallow depth and also not working hard).
- You should always analyse your gas before putting your equipment together.
- In appropriate depths you could add an extra element of safety if you dive nitrox, but keep your computer set to air or a weaker nitrox mix.

Gas mixes for deeper dives

- If you are diving deep, then you should consider using trimix to reduce the effects of narcosis and improve work of breathing. BSAC recommends choosing a gas that gives you an equivalent narcotic depth of 30m or less, especially if you

are undertaking a complex dive. However, a high level of helium can also increase the amount of decompression time some algorithms ask you to do, which can add other risks. You need to plan your dive carefully taking into consideration the risks and choose an appropriate gas for your plan.

- There is a risk of passing out from hypoxia (lack of oxygen) when the partial pressure of oxygen is below 0.15 bar, and so you should be very careful when diving with hypoxic gases, and use travel gases if necessary.
- You should also be very careful when using hypoxic diluents when diving on a rebreather and monitor the partial pressure of oxygen at all times.

Gas reserves

- You should plan your dives beforehand, including calculating an adequate gas reserve.
- Gas consumption can vary enormously between divers, and even the same diver can have different gas consumption rates depending on cold, exertion, experience, and depth. You should therefore monitor your own and your buddy's gas supplies throughout the dive to ensure your reserves are still adequate. The size of an adequate reserve will depend on the capacity of the cylinders, the planned dive, and both your breathing rate and that of your buddy.
- BSAC recommends that a good rule of thumb is to surface with one-third of your primary cylinder(s) left

as a reserve (around 75 bar in a 232 bar cylinder).

- You might decide that under some circumstances a reserve of a third might not be enough. You should plan the dive beforehand and decide on a larger reserve if this is the case. Remember that a stressed diver can breathe at a surface breathing rate of 50 litres/minute or more during the first stage of an incident, and potentially not relax until their first decompression stop. In particular, if you are doing a deep dive with lots of decompression you should carry a reserve sufficient to cope with a failure.
- A reserve is to cope with unforeseen circumstances happening to you or your buddy. It should not be used to extend dive time.

Nitrogen narcosis

- Narcosis can slow down your reactions and impair your decision-making ability. This means that if you have a problem while you are suffering from narcosis, you are less likely to resolve it successfully.
- You should plan deep dives especially carefully, and think about how you will deal with an incident if you are suffering from narcosis.
- You can use trimix to lessen the effects of nitrogen narcosis.
- On dives using trimix, BSAC suggests using an equivalent narcotic depth of 30m.

Oxygen toxicity

- The oxygen in breathing gases is essential for life but can become toxic at partial pressures above that found in air at the surface (a partial pressure of 0.21 bar).
- When mixed gases and nitrox are being used the partial pressure of oxygen should not exceed 1.4 bar for each mix used for either travel (descent and ascent) or bottom phases.
- For divers holding an appropriate qualification an oxygen partial pressure of 1.6 bar may be used for decompression purposes down to a maximum depth of 10m. All divers who do not hold a suitable qualification should not exceed a 1.4 bar for any chosen gas mix.

Equipment

Alternative supply (AS)

- Every diver should have an AS on every dive.
- An AS could be an octopus (an additional second stage attached to the first stage of your main regulator) or an independent alternative supply (such as a pony cylinder with its own regulator).
- If you are using an octopus regulator, you should make sure that the first stage will provide enough gas for two divers in an emergency. Regulators that confirm to the EN250 standard should be able to do this. Ensure that the manufacturer certifies use of the regulator at suitable temperatures for the dive.
- If you are using a pony cylinder as an AS, it should have a capacity of at least three litres.
- Auxiliary cylinders having a capacity of less than three litres and BC mouthpieces (with/without an integrated second stage regulator) are not considered an adequate AS.
- For dives below 30m BSAC strongly recommends an independent AS such as a ‘pony cylinder’ or separate regulators attached to separate cylinders. If a manifold is fitted to the pair of cylinders it should allow the diver the ability to isolate each cylinder/regulator assembly should a failure occur.
- Sometimes the AS is on a long hose, often 2m long. If you and your buddy are not holding on to each other, there is a risk that the donated regulator could be pulled from the receiver’s mouth. The receiver should

hold the donated regulator (or its hose) to reduce this risk.

- You should brief your buddy before the dive on how to use your AS in case they need it. A good way of doing this is to give a demonstration of the out of gas response (a 'dry-run').

Buoyancy compensator (BC) cylinders and delayed surface marker buoy (DSMB) cylinders

- Some BCs and DSMBs can be inflated using a small dedicated cylinder, typically 0.1 or 0.2 litres in capacity. These can be refilled from larger cylinders.
- The testing regulations for mini-cylinders are the same as for your main cylinder. As you will be filling the mini-cylinder yourself (from your main cylinder) you might not think that it is necessary for it to be tested. However, you should get mini-cylinders tested in accordance with current BS EN test standards as they could harm you if they fail while being filled.
- You should make sure that you do not overfill mini-cylinders. Some only have a working pressure of 207 bar, and you need to be careful if you are filling these from a 232 bar or 300 bar cylinder.
- Try to avoid completely emptying mini-cylinders, as water can work its way into the empty cylinder and cause corrosion.
- You should not use rich nitrox mixes to fill a mini-cylinder unless it is in oxygen service, adhere to manufacturer's recommendations.

Checklists

- A checklist can help you prepare your equipment thoroughly and in a logical way, meaning you are less likely to make mistakes in assembling it.
- The use of appropriate checklists is especially important if you dive with rebreathers as they require specific pre-dive checks.

Cylinder labelling

- When diving with nitrox, BSAC advises that you mark your cylinder with the nitrox mix and maximum operating depth (MOD).
- If you are carrying different gas mixes in different cylinders, for example when using rich nitrox mixes for decompression, you should take extra care to analyse and if necessary remark your cylinders with gas mix and MOD as appropriate.
- Breathing the wrong gas at depth can have very serious consequences. When diving with multiple cylinders, BSAC recommends you should use a system to prevent you confusing the cylinders, such as colour and shape coding; mouthpiece guards; and cylinder placement conventions such as rich-right/lean-left.

Cylinder pressures

- You should not fill a cylinder higher than its working pressure.

- BSAC recommends that you check your cylinder pressure before the dive, and at regular intervals throughout the dive.
- BSAC recommends that you surface with a minimum of one-third of your cylinder's capacity left as a reserve. For example when diving with a 232 bar cylinder you should surface with around 75 bar left as a reserve.
- However, there are some circumstances (for example deep or long dives, and no clear surface dives) where this is not an adequate reserve.
- For decompression gases a reserve of 50 per cent is recommended.

Cylinder testing

- Cylinders must be in test according to the standards set down by the relevant authority and should be stamped with the date and type of the most recent test, which enables divers to know the next test date.
- Cylinders not 'in test' must not be filled.
- If your cylinder passes its test, the cylinder shoulder should be stamped and you should also receive a certificate.
- If you plan on putting oxygen or nitrox in your cylinder, (including by partial pressure blending nitrox), your cylinder must be inspected and cleaned every 15 months. Your cylinder should be marked to show that it's in oxygen service.

Delayed surface marker buoys (DSMBs)

- Deploying a DSMB is one of the most common things to go wrong on a dive, and so you should practise this skill regularly.
- Do not attach the reel to yourself or to your equipment because if it jams you will be dragged to the surface. Instead make sure you can jettison the reel quickly in case you need to.
- There is a convention that a single DSMB means “situation normal” but a red DSMB and a yellow DSMB on the same line indicates a problem. If you plan on using this system you should make sure that everyone on the boat, including the skipper or coxswain, is aware of the situation.
- If you plan to use an alternative signalling method ensure all are aware of the meaning and the action to take if it is deployed.

Dive computers

- Dive computers offer accurate and automatic recording of depth and time and continuously calculate the diver’s decompression requirements according to the depth and duration of the dive.
- Computers are also available with advanced features such as the ability to calculate decompression requirements for a variety of nitrox mixes and mixed gases, and also to monitor available gas and gas consumption rates.
- The use of a dive computer is no substitute for

proper dive planning, including proper attention to gas requirements and dive time. Divers should learn how to use the planning function on their own dive computer and apply this practice prior to every dive.

- Individual susceptibility to decompression illness varies and can be affected by a number of factors, for which no computer or decompression table is able to allow. Divers should be aware of this and avoid pushing computers beyond their limits.

Diver propulsion vehicles (DPVs/scooters)

- Ensure you obtain training and practice in the use of DVPs.
- Buoyancy control can be more difficult when using a DVP. Make sure that you are not using its power to compensate for being negatively or positively buoyant.
- When using a scooter, you should consider what would happen if the scooter failed. This is particularly important on dives where you are planning on returning to the shot, or need to return to a particular entry point when shore diving.
- A flooded scooter can be very negatively buoyant, so you might want to carry a lifting bag to recover it to the surface.

Lifting bags

- If you lift a heavy object using your own buoyancy from the seabed and drop it, then there is a good

chance you will have a rapid ascent. You should therefore avoid using your BC or drysuit to carry heavy objects (for example when moving the shot weight to closer to the wreck), but instead use a lifting bag.

- If you plan to send an object all the way to the surface by making it positively buoyant, then you should make sure you are not directly under the object. If there is any current, you should also make sure that there are no divers downstream of the object.
- If you are lifting very large objects, you should take extra care, for example by using multiple lifting bags, and/or breakout bags so that the lift is as controlled as possible. If you do not have experience of this yourself, you should think about involving someone who does have experience of this, or going on a course to learn more.
- The recovery of objects from underwater may be subject to legislation and all divers should ensure they comply (see **Legislation**).

Manufacturers' recommendations

- In addition to the guidance given in this document the manufacturers' recommendations for their equipment should always be adhered to (for example, frequency of servicing).

Rebreather, closed-circuit (CCR)

- You must obtain a formal qualification from a recognised agency to dive with a rebreather on a club dive (except if you are doing a rebreather try-dive).
- If your buddy is unfamiliar with rebreathers, there are a number of issues that you will need to explain to them:
  - How to lift you to the surface. This is more complex with a rebreather as your buddy will have to dump gas from your counterlungs as well as your drysuit and wing.
  - How to close the mouthpiece in case you pass out and it falls out of your mouth, flooding the unit. This should be done well before the buddy check.
  - A breathing loop flood will cause a significant loss of buoyancy requiring more action to establish positive buoyancy than otherwise anticipate.
- You should follow the manufacturer's recommendations regarding maximum scrubber duration and not exceed it. While it may be acceptable to do multiple dives on one scrubber fill, you should be scrupulous about recording how long a scrubber has been used for. If in any doubt, you should change the absorbent.
- You should make sure your scrubber is correctly packed. You can weigh the scrubber to make sure

that it is holding the right amount of absorbent. Remember that long journeys or bumpy boat rides can increase the risk of the absorbent settling and causing “channelling”.

- You should change your oxygen cells at the manufacturer’s recommended intervals, if not sooner.
- You should use the type of battery specified by the manufacturer and change them at the manufacturer’s recommended intervals or sooner. Some rebreathers give a warning when the voltage drops to a critical level, at which point you must change the batteries.
- You should disinfect the breathing loop at the manufacturer’s recommended intervals. Make sure that you are using the correct disinfectant in the right concentration, and that you let it remain in contact with the loop for enough time.
- You should be careful when using a rebreather on the surface as there is a risk of hypoxia, especially on manual rebreathers or if you are using hypoxic diluent.

Rebreathers, semi-closed circuit (SCR)

- If you are diving a semi-closed rebreather you should make a slow ascent. If you ascend too quickly there is a risk that the oxygen level of the loop will fall quickly and the loop could go hypoxic.
- You should always check the flow rate of a semi-

closed rebreather before each dive. A blocked jet can make the loop dangerously hypoxic.

- If you plan on swimming on the surface while diving a semi-closed rebreather, BSAC recommends that you switch to an open-circuit regulator or a snorkel, to stop the loop becoming hypoxic.
- If in doubt about the partial pressure of oxygen loop, manually flush with breathing gas.

Shutdowns

- If you dive a manifolded twinset, you should be able to shut it down very quickly in case you have a free flow.
- You should practise shutdowns regularly. This will not only make you quicker, but will reassure you that you can still perform this important skill.
- If you cannot shut down a manifolded twinset quickly enough, then keep the manifold closed and dive your twinset as two independent cylinders.

Surface detection aids

- BSAC recommends that you think about carrying one or more surface detection aids to make you more visible to boats, and to rescue aircraft.
- As well as a DSMB, useful detection aids include
  - Torches
  - Strobes

  - Fold-up flags
  - Signal mirrors (polished stainless steel – not glass)
  - High-power whistles (various mouth-powered ‘storm whistles’, and direct-feed-powered air horns)
  - Radio distress beacons
- There are several types of radio distress beacons available for diver location in an emergency
  - Personal locator beacons (PLBs)
  - Emergency Position Indicating Radio Beacons (EPIRBs)
  - Submersible transmitter/receivers

Weights and weight belts

- If you are correctly weighted for buoyancy and trim it will make your dive safer, more enjoyable, and you will use less gas.
- You should weight yourself so that you are able to hold a safety stop, horizontally, with near empty cylinders.
- If you are diving with new or unfamiliar equipment, then you should do a proper weight and trim check to make sure you are correctly weighted and can hold horizontal trim without finning or sculling.
- Remember seawater provides more buoyancy than freshwater and so you will need to add weight when moving from freshwater to seawater.

- In the event of an incident it may be necessary on reaching the surface to release weights and the emergency method of weight release should be covered in a buddy check.
- Ensure that any weights or the weight belt cannot be snagged by other equipment. It may be necessary to release other equipment such as BC crotch straps before releasing a weight belt.

Decompression

Altitude diving (and flying)

- Beware of diving at altitude, and of flying or travelling to altitude after diving. At altitude atmospheric pressure is lower than at sea level, even in a pressurised aircraft. The reduced pressure has implications for your decompression obligations. It also means that you may not be able to travel at altitude, or travel in an aeroplane, if you have been diving recently.
- BSAC ‘88 tables have four levels that allow you to understand both the decompression obligation of diving at altitude, and whether you can safely travel to altitude or fly after a dive.
- While BSAC ‘88 tables indicate divers can fly in a pressurised aircraft on a code B, BSAC suggests you wait 24 hours between diving and flying if possible.
- Some dive computers have different altitude

settings. You should make sure that you understand how your dive computer works, and that it is set to the correct setting.

Ascent rate

- The safe ascent rate is a trade-off. Ascend too quickly and you will have an increased risk of decompression illness (DCI). But if you ascend too slowly you will absorb additional inert gas (nitrogen and/or helium), which could give you an increased decompression obligation.
- BSAC tables are compatible with a slow ascent rate, as the 'dive time' includes descent, bottom time, and ascent time. However you will need to factor in the slow ascent when planning your dive.
- Dive computers will automatically recalculate if your ascent rate is slower than planned, but they may require you to do extra decompression stops as a result.
- You should make sure that you are in control of your ascent rate at all times. You should be able to stop quickly at any time.
- You should always ascend slowly from 6m to the surface. This should take at least one minute.
- Using a shotline or other fixed datum will help you to control your ascent rate. Do not watch other divers to gauge your ascent rate. If they are ascending too fast, or too slowly, you will automatically follow them.

BSAC tables

- BSAC considers BSAC decompression tables (’88, nitrox & ox-stop) to be safe diving tables. If you use a different set of tables or a dive computer, then BSAC recommends they are at least as conservative as BSAC tables. This means they give the same or shorter no-stop time for a given depth, or give the same or longer decompression stops for a given profile, compared with BSAC tables.
- Because BSAC tables work on the basis of a ‘dive time’ that includes ascent time, rather than ‘bottom time’ BSAC tables are compatible with a slow ascent. However, if you plan to take advantage of this, you must start your ascent sooner.
- BSAC recommends that if it is safe to do so, you should do a safety stop of at least one minute at around 6m. Longer safety stops are even better. However, safety stops are optional, and there may be some circumstances when it is more sensible to omit the safety stop and ascend directly to the surface, for example if you are running low on gas or if sea conditions make maintaining accurate depth control difficult.
- If you are using BSAC tables, BSAC recommends you should not conduct more than three dives in one day, and that if you are diving deeper than 30m you should take a 24-hour break after diving for four consecutive days.
- You should be aware that the advice given under

Decompression (below) applies to all dives, including those using BSAC tables.

Decompression

- When you dive your body will absorb inert gases, and will start to release them as you ascend. It is important to know whether your dive profile is safe, so BSAC recommends that you plan and monitor your dive with either a computer or with decompression tables.
- BSAC also recommends that you produce a back-up plan in case something goes wrong on the dive.
- Age, fitness, exertion, obesity, smoking, alcohol consumption, fatigue, dehydration and injuries can all make decompression illness more likely. You should be aware of these factors and take them into account by diving conservatively and not pushing the limits of your chosen decompression computer or table.
- You should try to avoid sawtooth profiles.

Decompression illness

- You should monitor yourself and other divers in the hours following a dive as while DCI symptoms can appear immediately, they may also take several hours to appear.
- Minor symptoms, such as tingling and numbness, can indicate a more serious problem, leading to

potentially greater disability than more dramatic symptoms such as intense joint pain, so anyone showing even minor symptoms should be treated as if they are suffering from serious DCI.

- You should administer oxygen and fluids to anyone suspected of DCI as soon as possible.
- You should contact the emergency services as soon as possible. They will advise on how/whether to evacuate the casualty, and how/whether they should be recompressed.
- In the UK you can contact the emergency services in the following ways
  - VHF radio channel 16 (at sea)
  - Dial 999 (on land)
  - In England, Wales, and NI, the National Diver Helpline on 07831 151 523
  - In Scotland you can call the Aberdeen Royal Infirmary Hyperbaric Medicine Unit on 0345 408 6008
- This information is updated on **bsac.com/dci**
- When abroad make sure you know the local emergency procedures.

Re-entry decompression

- If a diver misses planned decompression stops, no attempt should be made to enter the water again in order to complete them (called re-entry decompression). In this situation the diver is

increasing the risk of DCI and merely placing a possible casualty in a hostile environment.

Decompression stops

- You should plan any decompression stops before your dive.
- For dives with long decompression stops you should think about decompressing as a group on a trapeze or lazy shot. This is because there will be plenty of gas and other support around if you or another diver has a problem.
- Conduct your decompression stops in a horizontal position so that all parts of your body are decompressing at the same depth.
- You should avoid vigorous exercise while decompressing, however light and gentle movement is encouraged.

Missed decompression stops

- If a diver misses any decompression stops, they should not re-descend.
- No attempt should be made to enter the water again in order to complete any decompression stops. In this situation the diver is increasing the risk of decompression illness and merely placing a possible casualty in a hostile environment (see **Decompression illness**).
- You should treat the diver as if they are suffering

from DCI, even if they are not symptomatic. This means you should administer oxygen and fluids.

- **You should call the emergency services immediately, and follow their advice.**

Dive management

Authorised branch dives

- An authorised dive by a BSAC branch is one carried out with the approval of the branch Diving Officer (DO), who appoints a properly qualified person to be the Dive Manager (DM) in charge of all diving activities for the duration of the dive or expedition.
- A table summarising everyone's responsibilities is available here **bsac.com/divedefinitions**

Dive management

- BSAC promotes the benefits of diving activity being conducted under the supervision of the DM.
- The DM is appointed by and derives their authority from the DO of a branch who in turn derives their authority from the National Diving Officer (NDO).
- A DM should be trained and practiced in the role, as is a qualified BSAC Dive Leader or above. A DM can delegate some tasks or responsibilities to assistants. A central part of being DM is assessing the risks involved and mitigating them as necessary. You should do this after considering all relevant factors,

including the qualifications and experience of the divers, the weather and tides, and the available dive sites. You should produce a dive plan that manages risk to those involved.

- To provide evidence of having considered and mitigated the risks it is advisable to have a documented risk assessment covering the major factors that you have thought about and to use this as the basis for a dive briefing at the start of the day.
- A DM should monitor the progress of diving activities until they are completed. This is so that you can take appropriate action if things don't go to plan. For example the weather might change, or the boat might break down.
- A DM or DM assistant, should complete a dive log to help monitor of diving activities. BSAC recommends that you record who is diving with whom, when they began their dive; and if appropriate, their expected maximum dive time. This information is important for checking that all divers have left the water safely, and for planning if a search may be necessary if they become overdue.
- Sometimes the DM may need to specify a maximum dive time. This may be for safety reasons, such as increasing currents, or for logistical reasons, for example if you plan diving in two waves.
- A DM should also consider recording planned maximum depth, gas mixes, gas pressures, cylinder sizes, remaining scrubber duration for rebreather divers, and any planned decompression stops.

- After the dive a DM should make sure that everyone has left the water safely and is feeling fit and well. A DM or an assistant should record divers' actual time and depth, decompression details, and whether there were any problems during the dive. You should consider recording divers' final cylinder pressures, as this can be a way of identifying whether the divers encountered difficulties underwater.

Dive planning and organisation

- When planning any dive the following factors should be considered
  - The divers' experience and qualifications
  - Divers' current fitness to dive
  - Divers' depth limitations
  - A suitable dive platform (and suitably experienced skipper, when boat diving)
  - A safety backup plan for all aspects of the dive in case of an emergency
- When boat dives are taking place, divers should make sure that a responsible person on shore has details of the dive plan and estimated time of return.
- When diving in the UK, the Maritime and Coastguard Agency (MCA) should be contacted by phone/radio to brief them of your intentions, and again after diving to confirm that you have returned to shore safely.
- Accurate records of diver training, dives and expeditions should be kept at all times.

- Additionally, planning for technical diving involves consideration of
  - The various combinations of gas mixtures to be used during the dive
  - The maximum operating depth (MOD) of the gases being used
  - The equivalent narcotic depth (END) of the gases being used
  - Scenarios involving the loss of gas mixes during the dive
  - Manufacturers' equipment-specific depth limit recommendations

Risk assessment

- Safe Diving is founded on the processes of risk assessment, which is inherent throughout diver training, dive planning and dive management. More information on risk assessment can be found at **bsac.com/riskassessment**

Surface cover

- Having dedicated surface cover means that an incident is more likely to be spotted quickly, and help may be quicker to arrive. However, in some circumstances it may not be practical to provide dedicated surface cover.
- If you are the DM, you should think carefully about whether you need surface cover or not, and if so, what form it should take.

Seamanship

Boats

- You should drive your boat cautiously in the vicinity of divers in the water. Those in the boat should keep an eye out for divers surfacing unexpectedly.
- When dropping divers or recovering them into the boat, the engine should be in neutral. After dropping divers, make sure they are well clear of the propeller before engaging gear.
- BSAC recommends that the coxswain should use an engine kill-cord In accordance with the manufacturer's recommendations.
- Dive boats should display the internationally recognised flag 'Alpha' when diving is underway to warn other boats to keep clear. It should not be displayed unless diving operations are actually in progress.
- It's a BSAC rule that boats used on BSAC events or for authorised branch diving, whether privately owned or not, **must** have third-party insurance cover, and it is the responsibility of the branch to make sure this is in place for their boats.
- More information on boats, including what equipment you need to carry, is available in the Combined Diving Associations' document Guidelines for the Safe Operation of Member Club Dive Boats.

Distress at sea

- VHF/DSC radio is the primary means of calling the emergency services from a boat when diving at sea around the UK.
  - If someone's life or the vessel is in danger you should make a Mayday call.
  - You can either make a voice call on Channel 16 or send a distress alert via Digital Selective Calling.
  - You should put out a Pan Pan call for serious problems that are not life-threatening.
- In emergencies, you are allowed to use the radio even if you don't have a formal licence. If you are unsure what to do, and there are no trained radio operators on board, pressing and holding the red DSC button will send a distress message to the coastguard automatically.
- Do not delay calling for help for too long, if you are convinced problems are arising that you cannot control. Several Maritime and Coastguard Agency reports, each year, indicate that some divers leave it too long before raising the alarm.
- Alternative methods of alerting the emergency services at sea include
  - Attracting attention by firing flares (do not waste flares, only fire them if you think someone will see them)
  - Mobile phones (but mobiles only works very close to land and if there is signal coverage) it is

a good idea to find out the number of the local Coastguard before you set out to sea

- Boats should have an Emergency call checklist displayed in a location convenient for the radio.

Pots, markers, and fishing gear

- You should try to avoid diving near lobster or crab pots, or other fishing gear. Not only is there a risk of getting your propeller or divers at the surface caught up in loose line, there are also underwater risks of entanglement for the divers.

Propeller guards

- A propeller guard, fitted to an outboard motor, gives a degree of protection from injuries to divers.
- Before fitting a propeller guard, take note of the manufacturer's recommendations and instructions, as it is possible to cause stress to the gear box and low end of the engine. Some loss of power may result from fitting a propeller guard.

VHF/DSC radios

- VHF/DSC radios are an important means of communication at sea (see **Distress at sea**).
- If you are using a radio in a non-emergency situation, then the boat should have a marine VHF installation licence, and you will need to have a

marine radio certificate of competency yourself (or be supervised by someone who has).

- VHF radios sold since 1999 must be fitted with, or be capable of being interfaced with, digital selective calling (DSC). DSC sets allow you to call a specific vessel, but they often have a red emergency button that allows someone to automatically call the Coastguard in an emergency.

Weather

- You should check the weather regularly. There are many good websites providing marine forecasts for several days ahead, and official Maritime Safety Information (MSI) broadcasts (including the Shipping Forecast and Inshore Waters Forecasts) on VHF and the internet. Radio and television bulletins may include MSI, and in some coastal areas where there is a lot of boating activity there may be specialised local marine forecasts which give details of localised variations in weather not shown anywhere else.
- In general, you should not dive if it is windier than a Force 4 in open seas.
- It may be possible to dive safely in much stronger winds if the dive site is sheltered from the prevailing wind, and the boat journey to and from the dive site is navigable in the prevailing conditions.
- There may be occasions when the sea state is too rough to dive, even if the wind is 'only' a Force 4. There will be many factors that influence this,

including what the weather has been doing for the previous few days, what the currents are like in that area, and what the underwater topology is like.

- As well as the sea state, other aspects of weather can affect diving safety.
  - Fog can be a problem, increasing the risk of lost divers and collisions with other vessels.
  - Hot, sunny days bring the risk of sunburn and dehydration.
  - Very cold days bring the risk of exposure, and even hypothermia, for divers in open boats.
- If you are diving at an unfamiliar dive site, it's a good idea to talk to someone who is familiar with the local area and weather who may be able to give you tips.

Medical

Automated external defibrillators (AEDs)

- A heart attack is a severe, life-threatening condition that can occur even in very fit people.
- Chest compressions are unlikely to restart someone's heart on their own. A defibrillator is often necessary to restart the heart. The more quickly a defibrillator is used, the more chance the casualty has of surviving.
- The more quickly a defibrillator is used, the more chance the casualty has of surviving.
- Defibrillators are becoming increasingly common.

Several manufacturers now sell weather-resistant AEDs suitable for use in open boats, making an AED a realistic addition to a diving first-aid kit.

- While AED devices are simple to use, formal training to use an AED helps with understanding and practice and minimises any reluctance to use one when necessary, BSAC runs formal training in AED use, which will improve essential lifesaving skills.

Basic life support (BLS)

- It is a good idea to get trained in BLS.
- Remember that your skills will degrade over time. You should practise your skills regularly.
- The Resuscitation Council (UK) regularly reviews and updates its recommendations on BLS. Its guidance, and consequently BSAC's guidance, changes as a result. **You can make sure that you are current and up-to-date by looking at BSAC's guidelines on the BSAC website bsac.com/bls**
- Current BSAC guidance for rescue breaths (RB) and cardiac compressions (CC) includes
  - In water give one minute of RB and then remove to safety as quickly as possible without further RB.
  - On land give CC/RB in the ratio of 30:2, achieving a rate of 100-120 CC/minute, using a chest compression of 5-6 centimetres.

Dehydration

- Dehydration may affect your risk of decompression illness, and you should make sure that you are properly hydrated before you dive.
- A good way to check if you are dehydrated or not is to check the colour of your urine; it should be clear.
- Be careful about drinking large quantities immediately before a dive. This may increase your risk of immersion pulmonary oedema (see **Immersion pulmonary oedema**). Instead you should drink small quantities regularly and often.
- When you are immersed in water the body decreases the amount of blood circulating in your body. This fluid has to go somewhere and hence you may need to urinate more when diving. After a dive you will need to replace these fluids regain normal hydration.

Drugs and alcohol

- If you are taking prescribed medication of any kind (except for the contraceptive pill), do not dive unless clearance has been given by an approved UK Diving Medical Committee referee.
- It is unwise, and possibly dangerous, to yourself and others if you dive under the influence of any recreational drugs or under the influence of alcohol. Remember that if you drink heavily the night before, you might still be mildly drunk and unfit to dive the following day.

Immersion pulmonary oedema (IPO)

- IPO is a condition that can affect anyone immersed in water, including swimmers and divers.
- Being immersed in water can cause blood to move from your extremities to the core circulation. In some instances this can cause fluid to seep into the lungs, a form of drowning.
- Some underwater problems that could be indicators of the effects of IPO include
  - Divers with breathing difficulties when not exercising particularly strenuously; breathing difficulties may be indicated by rapid, uneven or heavy breathing or coughing uncontrollably
  - Confusion, swimming in wrong/random directions
  - Inability to carry out normal functions, while appearing to have to concentrate on breathing
  - Belief that a regulator is not working properly
  - Indication of 'out of gas' when their regulator(s) are found to be working correctly
  - Divers refusing or rejecting an alternative supply when 'out of gas'
  - Indication of difficulty of breathing when on the surface
- Advice from the medical experts at this time is that if you experience breathing difficulties underwater you should terminate the dive and ascend safely and exit the water. If you recognise any of the above factors in a buddy then assist them from the water as quickly as it is safe to do so.

Medical certificates/examinations

- Some medical conditions, or prescription drugs, are not compatible with safe diving. You therefore need to comply with the relevant medical requirements.
- In many cases, a self-certification form is enough. However, if you answer “yes” to any of the questions, you will need to refer to a diving doctor. Diving doctors are medical doctors who are approved by the UK Diving Medical Committee for this role. The most up-to-date self-certification form, and a list of diving doctors, are on the UK DMC’s website **www.ukdmc.org**
- Even if you have a valid medical, you should make sure that you are fit to dive.

Oxygen first-aid (for diving-related injuries)

- Oxygen is an effective first-aid treatment for all diving-related injuries including DCI, near-drowning, trauma, carbon dioxide toxicity and shock. However in cases of DCI, it is a first-aid treatment and not a substitute for recompression.
- The only time that oxygen should not be given is if the diver is actually convulsing. In this case you should wait until the symptoms have subsided and then administer oxygen.
- Whenever oxygen is administered medical advice should be sought and followed.
- While dedicated oxygen administration equipment

is by far the best option available, don't forget that rebreathers and rich nitrox mixes are a source of oxygen which can also be used to treat DCI if dedicated equipment is exhausted or not available.

- When planning to go diving, you need to think about how much therapeutic oxygen you need to take with you. This will depend on lots of factors, including how remote the site is, what depths you are diving to, what rescue facilities are available, whether the charter boat carries oxygen, and others.

Patent foramen ovale (PFO)

- A PFO is a hole in your heart that allows blood (and bubbles) to move from the right side of the heart to the left.
- Around a quater of the population have a PFO. Although most PFOs are very small, the consequence for divers of having a PFO is that it can increase the risk of DCI. This occurs as a result of bubbles in the venous circulation (which would normally be filtered out in the lungs) shunting across to the arterial circulation, where they continue to expand in size.

Pregnancy

- There is little medical evidence one way or the other, but there might be a risk to your baby if you dive while pregnant. Deep diving, DCI or any other diving ailment, and also recompression treatment, could all

increase this risk.

- If a woman discovers she is pregnant and has been diving during the pregnancy, she is advised to discuss her case with a BSAC Medical Referee.

Work of breathing (WOB)

- The act of breathing uses energy. When you are diving, it is harder to breathe than when you are on land, and so you use more energy and have an increased work of breathing.
- Having a high work of breathing increases the risk of carbon dioxide toxicity and narcosis. It can also increase the risk of immersion pulmonary oedema.
- Inappropriate or poorly maintained equipment can increase your work of breathing.
- Rebreathers often have higher levels of work of breathing than open-circuit regulators.
- At depth, the increased gas density also increases the work of breathing. The physiological effects of this become increasingly important below 40m. To reduce this risk you can use trimix to reduce the gas density.

Military diving

- Recreational diving within the UK military is subject to the regulations in BRD 2806 (5), which references BSAC Safe Diving but may include additional requirements so both documents should be referred to.
- On the issue of dive computers
  - The military regulations specify additional information on dive planning when using computers.
  - When planning dives using a dive computer to monitor and manage a dive, no more than three dives should be carried out in a calendar day.
  - Before commencing a further sequence of dives a minimum surface interval of 10 hours should be observed.
  - When multiple dives are being planned, the divers and Sub-Aqua Diving Supervisor must ensure there is an appropriate surface internal between them commensurate with the depth and duration of each dive.

Others

Insurance

- As part of your BSAC membership, you have third-party liability insurance which includes member to member liability insurance. You should check the policy details published on the BSAC website (**bsac.com/memberinsurance)**, or speak to BSAC HQ, to make sure the insurance meets your needs.
- Make sure you are adequately insured for other risks, for example, if diving overseas.
  - Travel insurance policies often have territorial limits, and are only valid in certain countries.
  - In addition to civil and criminal liability cover, you may need rescue and medical insurance to avoid potentially huge bills in the event of an accident.
  - Some policies place restrictions on the type of diving they cover depth limits, within the limits of your qualification, with/without an instructor (if you exceed the limits this may invalidate the policy).
  - Look at the depth limits of the policy; check on cover for criminal acts, check on cover for kit, what repatriation costs are covered; check whether recompression chamber treatment costs are included; check the medical treatment cover.
- The BSAC policy does not cover personal or club

diving equipment or boats, and it is a BSAC rule that all boats used for branch diving, whether privately owned or not, must be insured for third-party risks with a minimum indemnity limit as recommended by BSAC. Your club therefore needs to make sure that this is in place.

- If you own a boat which you use for diving it is your responsibility to ensure it is properly insured.
- If your club uses the club boat for water skiing then you should make sure that this is covered by your insurance policy.
- If a diver has an incident likely to result in a claim on the BSAC insurance policy, then they must make sure that it is reported to BSAC promptly. Further details on reporting incidents and the insurance policy can be found on the BSAC website.

Legislation

- There are relatively few UK laws or regulations covering recreational diving, however you should be aware of basic UK wreck law.
- If you recover any item from a wreck (whether cargo, parts of the wreck, or other items) you need to declare it to the Receiver of Wreck, a government official. You must also declare items that you have recovered abroad, but are bringing back into the UK. You can do so on a form that can be downloaded from **www.gov.uk**.
- Some historic and military wrecks are protected.

  - In some cases this means that all diving is forbidden on or near the wreck.
  - In other cases, you are allowed to dive the wreck, but need to obtain permission from the licensee beforehand. The licensee may stipulate restrictions, such as no penetration, when granting a licence.
- You are generally not allowed to take items from protected wrecks.
- Protected wrecks are marked on nautical charts, and a list can be obtained from the Receiver of Wreck.
- In the UK, you may need a licence from the Marine Management Organisation (MMO) if you plan to lay permanent structures or remove material from the seabed, including wreck, shellfish, marine litter etc. (see MMO website **www.gov.uk/guidance/do-i-need-a-marine-licence#diving-activities**)
  - There are UK minimum landing sizes and maximum numbers for fish and shellfish, including lobsters, crabs, and scallops. There may also be close seasons for some species.
  - In some areas of the sea there are restrictions on whether, or when you are allowed to take shellfish. In some cases you must have a licence before doing so. You should check the local by-laws before taking any shellfish.
- There is legislation covering boating and towing boats on public roads. You can find out about this by attending the BSAC Boat Handling skill

development course, and by reading the BSAC publications Seamanship: A guide for divers and Boat Towing and the Law, the latter is available for download from the BSAC website.

- If you are teaching 'at work' in the UK then the Diving At Work Act 1997 and its Attendant Codes of Practice (ACOPS) apply to you. 'At work' means that you are diving for profit. Having legitimate expenses reimbursed does not mean that you are 'at work'.
  - Some elements of the ACOPS apply to all types of paid diving.
  - Other elements only apply to specific sectors of the industry.
  - The sectors most relevant to BSAC divers are when diving as part of an archaeological or scientific survey; when instructing for reward; or when diving as part of a media project. Each of these genres have a dedicated Code of Practice which is enforced by the Health and Safety Executive (HSE).

Reporting accidents and incidents

- You should tell BSAC about any diving incident, by completing an incident report form, which is available on the BSAC website (**bsac.com/incidents**)
- You should not only report incidents that might give rise to an insurance claim. BSAC collects and collates incident data. It uses this information to

analyse trends in diving incidents, and to improve diver training and safe diving practices.

- You should report incidents even they were successfully resolved and no-one got hurt. For example, if your buddy's octopus free flows and you successfully share gas to the surface, you should still report this as it will help us understand how well the techniques we are teaching work in practice.

The Diver's Code of Conduct

More and more people are taking to the water; some for recreation; some to earn their living. This code is designed to ensure that divers do not come into conflict with other water users and sets out some guidelines which should be observed alongside the regulations relating to Marine Nature Reserves.

Before leaving home

Contact the nearest BSAC club or the dive operator local to the dive site for their advice. Seek advice from them about the local conditions and regulations. If appropriate, have the correct chart and tide tables for the area to be dived.

On the beach, river bank or lakeside

1. Obtain permission before diving in a harbour or estuary or in private water. Thank those responsible before you leave. Pay harbour dues.
2. Try to avoid overcrowding one site, consider other people on the beach.
3. Park sensibly. Avoid obstructing narrow approach roads. Keep off verges. Pay parking fees and use proper car parks.
4. Don't spread yourselves and your equipment since you may upset other people. Keep launching ramps and slipways clear.
5. Please keep the peace. Don't operate a compressor within earshot of other people or late at night.

6. Pick up litter. Close gates. Be careful about fires. Avoid any damage to land or crops.
7. Obey special instructions such as National Trust rules, local byelaws and regulations about camping and caravanning.
8. Remember divers in wet or drysuits are conspicuous and bad behaviour could ban us from beaches.

In and on the water

1. Mark your dive boats so that your club can be identified easily.
2. Ask the harbour-master or local officials where to launch your boat and do as they say. Tell the Coastguard, or a responsible person, where you are going and tell them when you are back.
3. Stay away from buoys, pots, and pot markers and don't interfere with them. Ask local fishermen where not to dive. Avoid driving through rafts of seabirds or seal colonies etc.
4. Remember ships have not got brakes, so avoid diving in fairways or areas of heavy surface traffic and observe the 'International Regulations for the Prevention of Collisions at Sea'.
5. Always fly the diving flag when diving, but not when on the way to, or from, the dive site. Never leave a boat unattended.
6. Do not come in to bathing beaches under power. Use any special approach lanes. Do not disturb any seal or bird colonies with your boats. Watch your

boat's wash in crowded anchorages.

7. Whenever possible, divers should use a surface marker buoy.

On conservation

1. Never use a speargun.
2. Shellfish, such as crabs and lobsters, take several years to grow to maturity; over-collecting in an area soon depletes stocks. Observe local byelaws and restrictions on the collection of animal and plant specimens. However BSAC recommends that you do not collect shellfish, but if you must collect, only take mature fish or shellfish and then only what you need for yourself. Never take a berried female (a female with eggs), this is stock for future years.
3. Never sell your catch or clean it in public or on the beach and do not display your trophies.
4. Ascertain and comply with seasonal access restrictions established to protect seabirds and seals from disturbance. During the seabird breeding season (1st March-1st August) reduce noise and speed near seabird breeding sites. Do not approach seal breeding or haul-out sites. Do not approach dolphins or porpoises in the water.
5. Be conservation conscious. Avoid damage to weeds and the sea bed. Do not bring up sea-fans, corals, starfish or sea urchins – in one moment you can destroy years of growth.
6. Take photographs and notes - not specimens.

On wrecks

1. Do not dive on a designated wreck site without a licence. Protected wrecks are indicated on Admiralty charts and marked by buoys, or warning notices on the shore nearby.
2. Military wrecks should not be disturbed or items removed from them. This includes the debris field. The debris field is the trail of wreckage that comes away from the main body of the wreck during the sinking process. This trail can consist of parts of the ship, the cargo and the personal possessions of the crew.
3. Do not lift anything that may be of archaeological importance.
4. If you do discover what might be an historic wreck do not talk about it, but contact the Receiver of Wreck **(row@mcga.gov.uk**), who will advise you about your next steps. If your find is important you may apply for it to be designated a protected wreck site. You can then build up a well-qualified team with the right qualifications to investigate your site with the assistance of a qualified archaeologist.
5. If you do lift any material from the sea-bed, it is a legal requirement to report it to the Receiver of Wreck as soon as reasonably possible; even if you own the wreck that the material has come from. Lifting material from the seabed is likely to require a licence from the Marine Management Organisation (MMO).

For further information contact **marine.consents@marinemanagement.org.uk**

6. Avoid the temptation to take souvenirs. Go wreck diving to enjoy the scenery and life, or get involved in projects. If you must take something, try photographs or measurements, and records of marine life.
7. Know and understand wreck law. If you remove material from wreck, which you then sell for profit, you are diving for reward, which is outside the scope of sport diving and you must conduct your dives in strict accordance with HSE regulations. A sound knowledge of wreck law will prevent you breaking the law, perhaps even ending up with a criminal record where no crime was intended.

Members are reminded that in the light of this policy following any conviction of any BSAC member for an offence in relation to wreck the member will be liable to have his or her membership withdrawn for bringing BSAC into disrepute.

Don’t let divers down - keep to the diver’s code

The Diver’s Code of Conduct that is set out immediately above was developed by BSAC many years ago, and is still relevant to all divers today. However environmental issues are of greater concern to all water users today than ever before, particularly when this code was developed, and so BSAC will be actively developing its environmental presence by the development of the following policies:

- To provide education in environmental awareness, understanding and enjoyment.
- To promote club participation in environmental schemes and events.
- Highlight current environmental issues, and work with other environmentalists in order to provide a united approach to deal with these issues.
- To further develop and update the Diver’s Code of Conduct.

Notes

Notes

For further details and information
please contact
BSAC Diving Resources Department
T: 44 (0)151 350 6200
E: drt@bsac.com

Membership enquiries
E: membership@bsac.com

bsac.com

September 2017