

DEEP DIVER MANUAL





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Chapter One

The deep diving

What will you learn?

Surely once you've been spending weekend in mountains and from the car definitely you have seen how the landscape varies the altitude, changes under your eyes: cultivated hills are replaced by chestnut trees and after the beech trees are replaced by snow; the air quickly became more attenuate and fresher and.... you would be forced to arm with boots and heavy sweaters.

In water the same thing happens, the environment introduces different characteristics in comparison with an immersion in low water, therefore it will be fundamental for you to acquire the knowledge useful as for the first immersion of this course and every time that you will practice a deep immersion. Surely it will also help you to improve your awareness of what your limits are in scuba diving, and to realise how much important is to maintain the equipment with care, and also the importance of accurate planning and the system of work in pairs.

The whole chapter integrates the theoretical part and the practical applications that you will develop with your Instructor ESA.

At the end of each chapter, you will find a simple questionnaire to complete, that you need to correct together with your instructor ESA.

The deep diving

Within the recreational underwater activity, the deep immersion is an immersion performed between the 18 and 40 meters.

Why more deep?

For instance, you dive on the beautiful walls so surely you'll get the desire to know what is under your fins and to discover what is down.



A wall is the classic objective of a deep dive



In fact, two main reasons to let you enrol to this course are: the search of adventure and the desire of the discovery. but, in every case, remember that every time that you immerse yourself deep you have to focus a concrete objective, so that to avoid to jeopardize safety and fun.

Never go down deep alone, you should all the time keep in your mind that the sea must not be challenged and that much less it has to represent a way to show something to us or to others.

If we start with this presupposition, we'll be ready to be welcomed in the new "departs of blue!"

We'll begin therefore to focus together some objectives for our deep diving:

1. To photograph or to observe some forms of life that are found only in depth, like magnificent red gorgonians or those rarer redheads and yellow that can spread for 25-35 meters.

They are both very beautiful and also very delicate, therefore be aware not to ruin it.

2. To visit a shoal.

There are many points of immersion that don't appear on the surface, but that can begin at the depth 18-20 meters as big towers: the examples are "Thila" on Maldives, or the "Erg" in Egypt.

3. To make an immersion on a wreckage or a wall.

Many types of wreckage are found at the depth over the 30 meters. In Mediterranean sea, there are thousands of examples: galleons, ships, aeroplanes and helicopters lay on the backdrops and also there are a lot of walls rich with new forms of life that you can explore.

In this way you will have a different sense and a real imprint from the immersion, but always remember to consider if it is really worth to go down deep, in fact many diving sites you can reveal more fascinating exploring on the lower depths. Shaab Sabina, situated in the East part of the reef that winds Giftun Kebir, is one of the islands of forehead to Hurghada, it is a nice point for diving that, in a few meters of water, offers a palette of colours that deign Michelangelo, and so many other points are the same, considering that however the sunlight hardly arrives to the depth and that in a lot of zones the

landscape results more “lunar.”

Typologies of deep diving

With the attainment of the certificate ESA Deep Diver, you'll receive the opportunity to discover new points of immersion, or you'll have chance to observe in a different way something that you already know.

You could decide to undertake a cruise on the reefs in Sudan, or to organize a trip to Cozumel in front of the Mexican coasts to see the giant sponges.

Every place introduces different characteristics and, as we speak about the techniques of diving, different ways of managing your immersion.

Diving along a wall

This type of dives is surely much diffused all over the world also because they allow to descend, to dive and to ascend, observing the life that populates the walls.

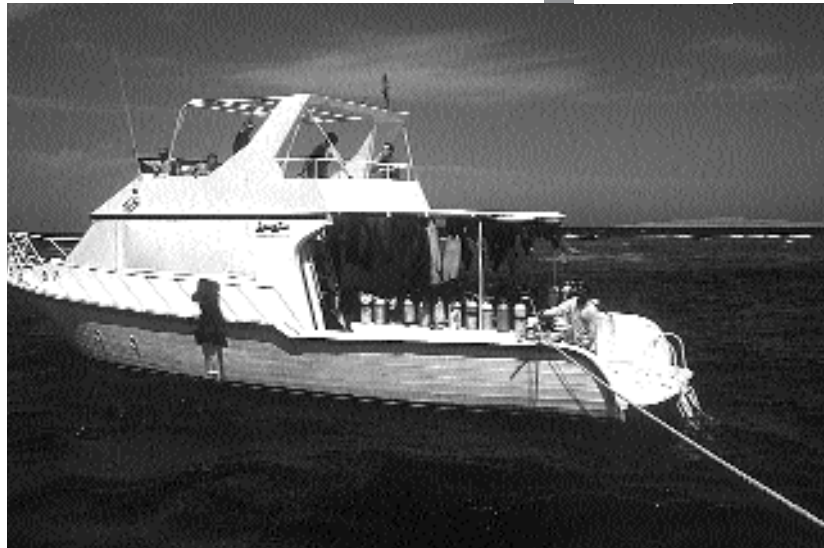
In Sharm el Sheikh, in Egypt, one of the “most requested” destinations, just in few footsteps from the beach of the hotel, from the surface you perceive luxuriant reef that sinks in the blue, so you wish to wear a cylinder and to plunge into the water, but in this case it is better to plan a dive in low water.

When we talk about deep diving, it is advisable to dive from a boat that guarantees a good support on the surface; it allows you to reach the selected site quickly and in case of emergency guaranties more effective assistance and faster transportation.

The immersions along a wall generally divided into two types:

With the boat that can be moored and therefore firm, or with the boat adrift that follows the scuba divers. In the first case the boat will be anchored next to the wall or to the reef, where it remains during the dive. In some countries, because of local dispositions, or because of environmental factors, the boat cannot approach too much close to the coral barriers, there-

Diving from a boat guarantees a good support on the surface



fore it will accompany you on the point of immersion, and it will remain until you'll make the signal for "taking you off" at the end.

Shoals and wreckages

These dives usually foresee descending along the line of the anchors or along a fixed buoy and the scenes appearing to our eyes are extremely involving, initially you will be spellbound the same as your partner feeling as an only element in an only colour: the blue one. Then, the deeper you go, it will begin to glimpse the outline of the wreckage or the shoal that begins plain and comes more and more definite. Remember: this course doesn't train you to penetrate into wreckages or in any closed places where there is no the direct access to the surface, therefore you visit the wreckage from the outside and you observe possible leaning parts however.

Planning a deep dive

Imagine, you have to organize a trip with your friends to wreckages on Goatherd, a very beautiful island in front of the coasts in Tuscany, surely the day

before you would meet all together to divide the responsibilities ant to make planning for the whole evening; for instance, to decide who has to fulfil the boat with gasoline and who has to get the coal for the barbecue, etc.

Surely so "equipped" you will be sure that you'll have a wonderful evening without unexpected moments.

As you have already learned before, planning the dive in all the details is extremely important for the safety and for our fun and, in the case of a deep diving, this aspect must be strengthened.

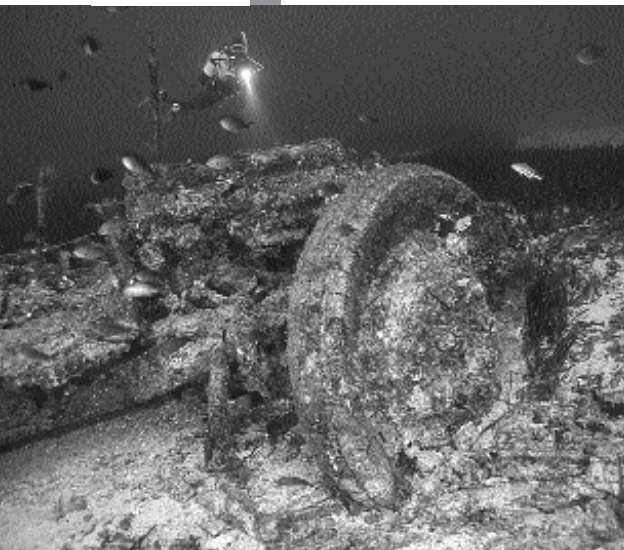
Contact your buddy and together establish objectives of your dive and its profile, both with the computer and with maps, establishing maximum

depth to be respected, this will help you to maintain the contact in water.

You also make a plan of emergency, in fact, if for some reasons you will exceed the established limit, you will have the limits of NDL foreseen for the following depth, but the important is that this profile remains a solution for emergency.

We make an example: Together with your partner

*Dives on wrecks
often ask for
dive in depth'*



you decided to make a deep dive to the Pope's Shoal in Sardinia to observe the marvellous fans of bi-coloured gorgonians (*Paramuricea clavata*). You know that the shoal begins from a depth of 16 meters and reaches 40 meters at the bottom, so you plan the dive at 33 meters where you will have the maximum time equal to 15 minutes. For safety, nevertheless, you will also check the non-decompression limit - 36 meters, that corresponds to 10 minutes, so in the case if you'll exceed the established depth, you will have available a new profile.

Don't wait to reach the NDL to ascend, but stay within the limits of the dive.

Receive all the information about weather and sea conditions through internet, TV, radio and VHF, so to avoid unfavourable environmental conditions.

The partner system

During dive our partner represents a guarantee of greater safety and fun, he lends us a hand to verify the operation of our equipment,

Remember to check the flow of air so in front of a beautiful Sea bass not to forget that you don't have the gills as it, and with a small stress appearing, it is enough for us to have the partner nearby to let us feel calmer....

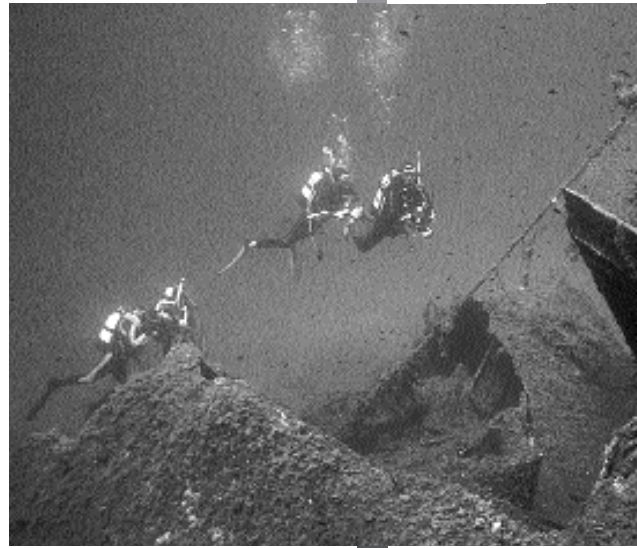
And don't forget how much wonderful is to share our emotions with another person!

In deep dives the system of pairs is extremely important, because the visibility and the light are worse in comparison with dives performed in low water, therefore it is easier to lose the orientation or to separate from the partner, and let us remember that the risks of nitrogen narcosis or exhaustion of the air are much higher.

If you work with a diving center, it could happen that your partner is a person that you don't know, in this case the first thing to be done is to present and to ask him in informal way (not as if it were a test) about the underwater experience, and also to overhaul with signals and the methods of communication.

Agree to give the signal when you'll have 150 bars, 100 bars, and to interrupt the dive before reaching the reserve, so to have the possibility to ascend quietly with respecting all the safety rules.

*In the deep
dive a system
of partner
increases the
safety*



To have own equipment allows to know it better and to intervene more quick in case of emergency

Agree to communicate when one of two computers will be near the safety limit (for example to 4 minutes) and start ascending up to the data of more conservative computer.

Equipment

As you already know, it is important issue for all kinds of diving.

You use all the following standard equipment:

- Fins
- Mask
- Snorkel
- Dive suit
- Regulator
- Spare regulator
- Air gauge
- BCD
- Timer and depth gauge or Computer
- Air tank

If you don't have your own equipment, the diving center will give you one for rent, but, especially for the deep diving, to have own equipment means more comfort and certainly more safety; in fact, if you know the equipment you wear during the dive good, you will be more quick to answer the problems and surely it will



be easier for you to manage it, as for instance to prepare the new for you equipment or to individualize quickly the device of inflating and deflating BCD system, hose, hooks, etc...

Before the dive you should be sure about equipment you'll use, it should be optimal and periodically should be revised.

Let's analyze together:

Cylinder: check the date of the last testing, haven' it been expired? The cylinders have to be submitted to a visual inspection to notice signs of usury at least once a year and to regular hydrostatic test, according to the rules (inform the instructor ESA or an ESA Point). In every case, the testing would be done each

A pony tank with the integrated regulator can resolve an emergency of lack of air, but it allows only ascending

time especially if the cylinder was bumped, or kept in exceeding temperatures (above the 80°C), sand blasting or if it's not used for a long time.

Besides that check that it contains the proper type of gas that you were intending to use.

Check if on the neck of the tank valve or around the safety disk there are signs of galvanic corrosion, in fact, during contact between two different metals in the water the dissolution of one of the two can happen, the consequent deterioration will have place.

Considering that you will breathe more air than during a dive in low water, verify that cylinder will be refilled with at least 200 bars.

O-Rings: always check the good state and don't wait for signs of usury to change them, do it!

Regulator/Demand Valve: it must be revised at least once in a year, if it introduces losses of air, even light, it is better to replace it.

Considering that the deeper you descend the air you breathe is denser so the effort is greater, if you use a balanced regulator, so more efforts while breathing don't increase the present pressure inside the tank, so it will also serve to prevent the worry.

Pressure gauge /Manometer: besides a good maintenance and annual revision, the only recommendation: often check it, and if you realize that while you are inhaling its' pointer oscillates it means that there is so few air or that the cylinder is not opened completely.

BCD: inflate it and put it in the water, verifying that beads don't go out from the sack or from the valve of unloading. Check the attack of the hose of low pressure and how quick you can deflate.

Spare regulator: both if you use a second regulator, and if you use an extra pony tank, a spare system has to be held in each dive, especially if you deal with deep diving, where the air is consumed much more quickly.



A computer connected to the hose of high pressure temporarily informs about dive data and about the air consumption

Verify that it's functioning, that it's easy to be found and to be used.

Dive Suit: if you dive in warm seas (Maldives, Caribbean etc.) it's not necessary to increase the thickness of your dive suit, but in many cases, because of severe climate or current cold that characterizes some diving points, the dive suit that is used in low water is not enough, and also it would be necessary to use accessories as gloves and hood, that can be missed in other kinds of diving. Besides, in depth the pressure decreases the thickness of the neoprene with consequent reduction of its insulating abilities. However, pay attention: the usage of gloves in some countries is forbidden, therefore ask the diving center for information about the zone, also they can recommend you the thermal protection more advisable to use.

Depth gauge and timer: they are also fundamental for all kinds of diving, particularly in those deep. Considering that sometimes they can have different settings, your deep gauge and that one of your partner can show some centimetres of difference, you make reference to the one showing out greater depth points, so you will have greater certainties to respect the pre-arranged planning.

Computer: The use of the underwater computers is extremely populated because of the safety and the simplicity in usage, in fact they undertake the functions of the depth gauge and timer and automatically calculate and show the non-decompression limit; besides they can have additional functions like: the memory of the dives, check of the temperature, graphic and etc.

You will use one, but planning every dive you'll use maps so that in case of breakdown you can always have some

parameters as a reference; a malfunction of the computer is rare, especially if you provide a regular maintenance and control the position of the batteries, but if that happened, you immediately interrupt the dive and start ascending with speed not exceeding 10 meters per minute and make a long safety stop at the depth of 5 meters (10 minutes or more).

Considering that not all computers give the same



The emergency base consists from a cylinder equipped with at least two regulators and from weights, fixed at the depth of five meters.

parameters, you always make reference to the most conservative one.

You will deepen knowledge of how to use the computer participating in speciality course ESA Computer Diver.

More deep diving equipment

Torch: As much as the depth increases, the light of the sun becomes more weak and the colours have the tendency to disappear, surely a torch will be useful for quick communication with the rest of the group, can attract for example their attention, moving it from right toward left, or to help you to read the tools and besides that to rediscover the magnificent colours, for instance, of our beloved gorgonians that in depth appear bluish.

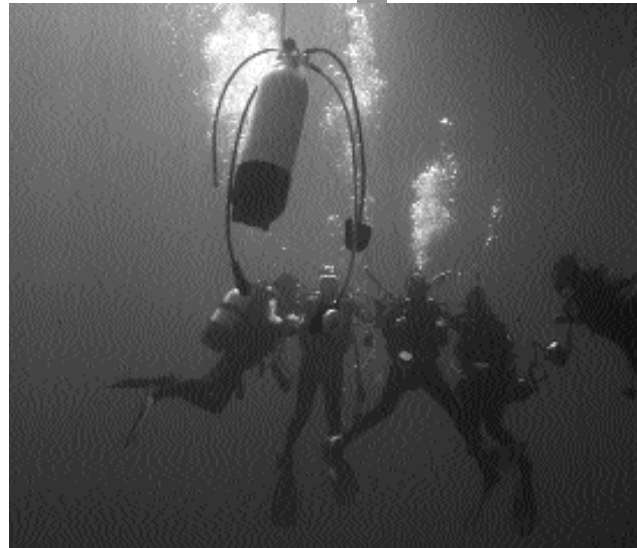
Reference line: extremely useful especially in presence of tides, it is fixed to the boat or to the base, so that once in water you can wait for the partner grabbing it without duty swimming and staying at definite point even with presence of waves and tides.

Emergency Base: In the dives foreseen by this course you can appreciate the use of a base of emergency.

It consists from a cylinder with at least two regulators and weights, fixed at the depth of five meters (nearly). As we confirmed many times, during the deep dive the air is consumed more quickly, therefore in the case that somebody arrives to the safety stop with lack of air in a cylinder, the emergency base can be very useful to let him breathe enough air respecting the time for the safety stop. The weights will help if reaching five meters depth with little air in the cylinder, you extend to be too much positive and so it will be useful to maintain the limit.

The preparation and the predisposition of a base of emergency can vary according to the places where you dive, in fact, if it will happen for you to dive in zones where the boat cannot moor, you can predispose a trapeze, connected to a rather big buoy with two tops that, departing from the same buoy, they have fixed at five meters depth with a steel auction to which the cylinder is tied up.

The assistant on the surface should put the trapeze in



Minitest

1. True or False.

It is advisable to make deep dives with the support of a boat.

2. Before a deep dive with your partner you will need:

a) To discuss again signals and methods of communication

b) To agree about the limit of air consumption and to check the manometer more often

c) Both a. and b. are correct

3. For deep dive it is advisable:

a) To use rented equipment to be surer

b) To use your own equipment but to verify its good operation

c) To buy a new equipment of garish colors, sgargianti

Answers: True - - 2 c - - 3b

water when with the dive buoy you would signal that you'd about to go up.

First Aid and Oxygen Kits: Both are essential in the list of the things to be brought on the boat, the Kit of First Aid has to be well prepared (as specified in the Manual ESA Prevention & Rescue Diver). For oxygen there are different devices, surely the most useful those that allow a smaller waste and the best effectiveness of the continuous flow.

Besides for the case of emergency verify that quantity of prepared oxygen is enough to reach the point of assistance. Check information about the nearest hyperbaric chamber or the medical center, if it is very distant, you will have to use a cylinder with a good ability.

These notions will be deepened in the paragraph "Benefits for the Emergencies"

Signaller for the surface: it has different names, but in reality it is the surface dive buoy or, note, a signaller of emergency. It consists of a flexible inflatable cylinder, located on the surface that signals the position of scuba divers during ascending. It is very useful for dives in places with currents where the boats cannot moor, for example, Maldives.

In case of deep diving it is useful if we ascend along the wall or in the blue one, so surface assistants could easily notice divers and avoid the passage of boats above divers' heads.

Deep diving techniques

Florence is one of the most beautiful cities of the world and when you visit it certainly you would not forget to cross "Ponte Vecchio", a bridge where, among old shops of goldsmiths and small cafeterias, painters of each nationalities steal a piece of landscape to withdraw it in their pictures.

There are those who use the oil paints, the water-colour, coal pencils There are so many different techniques to represent the same subject.

Like one of these painters, in this part of theoretical unit we will learn the best techniques for bringing to your memory new emotions and new adventures, respecting the subject of safety.

We'll "decompose" your dive into many small parts with the purpose to analyze them so to be able to set the accent on the adroitness especially when you immerse more deep.

The pre-dive check it's more important in the deep diving

Descending

To descend correctly means to begin our immersion with a low speed, more relaxed, it's safe and more predisposed to bring us a good time.

We have already seen, speaking about Planning a deep dive, that it is important to take care of every detail, therefore, before the descent, we have to assure that all our equipment both in order and "ready to the use" so to avoid the situation that in the water you'll realize that something has been forgotten on a boat....

Do you remember about the pre-dive check with your partner?

We'll remind the fundamental steps again.

To be sure about checking everything and in the correct order, remember to verify:

BCD (you will check if the low pressure hose is connected and if the system of inflating works correctly)

Cylinder valve (verify if it is well opened and if you feel noise of air spillage)

Air (How much air does manometer point out? Pressing the button of drainage, does the hand stir?)

Weights (check if weights are distributed in a good way around the body that the buckle is not jammed by some weights and that in case of necessity it can quickly be abandoned by an only hand)

Spare regulator (should be in a well visible position and ready to be used)

Regulator (check that it works properly)

Besides insure that the mask is positioned in comfortable way on the face (without hair or hood inside). Once in water with inflated BCD exchange the regulator with the snorkel to save air (you are about to make a deep dive, remember, that you will consume more air than during the dive in low water!).

If you have a rope on the surface - grab it, so you will remain next to the boat or to the station of support,



The descent in vertical position facilitate the equalization and the orientation



without hampering the entrance to water for your partner or the entire group.

To avoid losses of time, check immediately weights: it will be enough to deflate the BCD, you hold a normal breath and without moving you will have to float with the water at the level of eyes.

When finally you are ready, at the point of the beginning of descent, exchange with the signal “We go down”, and after having exchanged the snorkel for the regulator, impose the timer and check if computer is turned on, signal the OK to the partner, then finally deflate the BCD and begin to equalize.

You go down in vertical position, with the feet in low (to go down “contrarily” you can provoke dizziness or disorientation and to complicate the manoeuvres of equalization), you remain next to your partner and use a visual reference as a degrading wall or a reference line; if you find it difficult to go down, before increasing your weight, test if the air is removed from the bellows, and fold up the knees, so you will move less water and you will facilitate your descent; to add other weight on the surface could play negative role for being once arrived to the bottom.

If you are diving in group, it is advisable to remain together, always to wait for those who need additional time for equalization.

Problems with equalization can happen with anybody, and however, whatever the problem is banal and easily resolvable, it can bring scuba diver to a stress situation, especially if he can see all others on the bottom in impatience, even nervously beating the finger on the timer...

The stress could increase to possible renouncement from the dive.

And then, surely, patience serves also to you, you will have the opportunity to relax, to correct position of some hoses detached by the small hook during the entrance to water and, above all it allows you not to accumulate time on the bottom and to consume air uselessly.

We will slowly continue our descending until we'll reach the established level; we'll position ourselves in neutral buoyancy ready to begin the dive.

Buoyancy control

Has it ever happened to you to observe the beauty of the gulls fluctuated in the sky?

They are pushed by the wind, they circle and then they plane up to return again in the middle of the

clouds...

But this to circle, to plane, does fly... do you remember something relative to this?

Don't we feel the same emotions going underwater? If during our dives we will maintain neutral buoyancy, the feeling will be the same one... but is it necessary to speak about the buoyancy in the manual for deep diving?

Already during the preceding courses you have learned that having good buoyancy means to avoid so many bothers as, for an example, to lift suspension, to damage the organisms by fins, to provoke to be hurt by coral or poisonous fishes, and you will avoid of anxiety so you will consume less air.

Generally, when you are diving with excessive ballast, you are forced to inflate the BCD too much, so in this case even if the chest is sustained by the jacket, the basin and legs will have the tendency to move downward turning you to diagonal position.

In this position you won't be hydrodynamic, therefore you will find more resistance to moving, wasting more energy.

During the dive the air we breathe is denser; therefore it is easier to feel anxiety:

Ineffective swimming, shabby leaning, an excessive weight can jeopardize your fun during the dive.

Try to correct your position in the water, take as reference the instructor, and try to be at the same level or slightly above and for the micro variations of level use breathing, this will allow you to save air.

As you know, when the depth decreases the air expands, therefore, if you move yourself to a smaller depth, remember to unload adequately the BCD to avoid quick ascending to the surface.

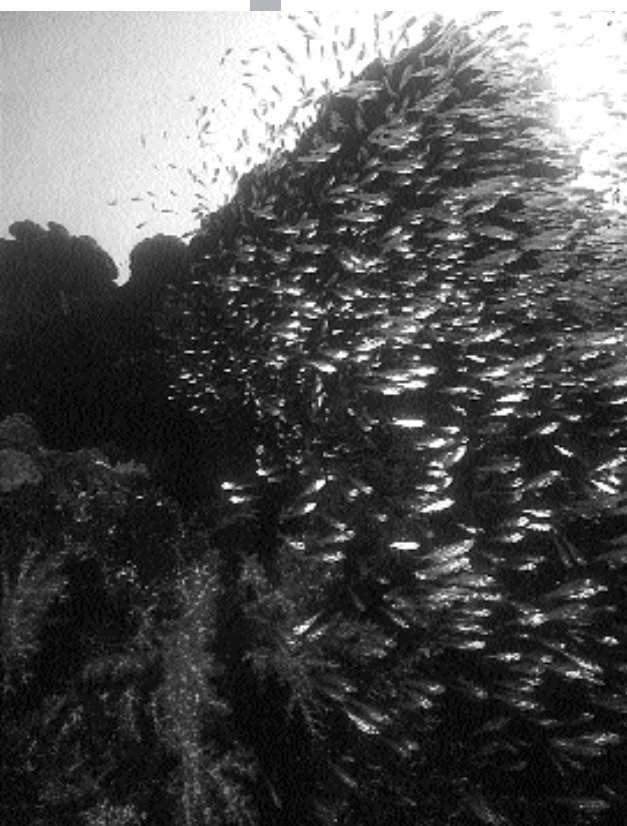
If for a long time you don't dive, or you use a new equipment, you need to precede your deep dive with an immersion in low water where you can check weights and to get familiar with the new equipment and get back to your fit, or you can attend the course ESA Hover Diver where you will be able to sharpen the techniques "to fly underwater."

Correct buoyancy in depth allows to save energy and to consume less air



Orienteering

*Descending
along a wall
facilitates the
orientation*



To know how to orient under water is extremely important, especially when you dive deep so you'll have less time to enjoy the dive because non-decompression limits are narrower in comparison with other immersions in low water.

In fact, if you don't know well the point of immersion, you could spend a lot of time looking for splendid gorgonians that you have promised to show to your partner and when finally you will find them it will be the time to start ascending.

The deeper you go the light decreases, the colours change and, accordingly, visibility is getting worse, the references that you would normally use could be less evident, therefore it is necessary to start orienteering as soon as we arrive to the

point of immersion; when we are still on the boat we are able to observe the wavy motion, the position of the sun, the tide, the morphology of environment that surrounds you (coast, rock-cliffs, reef and etc...) it can help you to understand how you will be positioned in comparison with the boat.

Let's take a practical example:

In Egypt, as in many other places, it happens very often to dive along walls or on islets bandaged by "herg", reefs coming up till the surface from the sea depth, if you will observe the profile from the surface so after you will see the same in depth, it will maintain more or less the same characteristics offering you a great contribution for orienteering you.

We suppose that together with your partner diving along one of these walls covered with gorgonians, dive is maintained to the left wall with current contrary, the sun will remain to your shoulders and the grains drawn by the waves on the surface will stir verse of you;

You can easily suppose that to return back the wall should be to your right; you will be turned toward the bundles of light of the sun, the tide and the wavy motion "will walk" in the same direction with you.

When we have spoken about the equipment, we have said that it is a good habit always to use the compass; surely it would be a real assistance in your deep dive, in fact, on the surface you will know how

you will be positioned during the descent in comparison with the wall or the stings that will need to reach.

You will continue also to direct yourself during descending.... How?

Everybody tries to avoid to go down in the blue without any type of reference, when you could find a light tide that extends to move you from the run that you had established, therefore always use a reference line or maintain close to the wall, try to keep close contact with your partner and exchange more often with “OK”, during the continuous descending look around so to find visible references, if you are going down along a line, you can check the depth gauge, the same your partner should do.

Once reached the established depth, it can often happen that conditions will allow you to be estranged from the reference line, surely if the visibility is not good it's better for you to remain in the proximity to the line, otherwise you can begin to focus on the references, for instance, on the rocks with a particular form or on the breakings of the reef that will allow you to find easily the way back to the boat or the station of support.

Remember: it is better not to plan long run during a deep dive, because the consumption increases, the visibility, whatever good, is worse in comparison with dives in low water made in the same zone and also the time that you can spend under water remaining within non-decompression limit is less.

In the lakes it can happen that visibility increases once overcome the first layers of superficial water, decidedly more flood water, anyway in these cases, you cannot exploit the sunlight as “system of illumination” and natural reference.

You can deepen the techniques of how not to be lost underwater at the speciality ESA course Orienteering Diver.

Since your first deep dive, you are used to strengthen the contact with your partner, maximum distance should be equivalent to the length of an arm, this will allow you to individualize immediately in case of necessity and at the same time you can move freely without hampering or bumping each other.

Try to exchange more often with “OK” and signal every change in direction!

Ascending

Minitest

1. Truth or False

Before every dive it is important to check the equipment so to verify that everything is in order and well functioning.

2. To avoid losing your partner underwater:

- a) *Tie up with your partner*
- b) *Don't estrange too much from the line of descent if visibility is not good*
- c) *Both a and b are correct*

Answers: True - 2 b

*Two divers
according for
the safety stop*

Beep, Beep, Beep...!

... Our dear friend computer signals that there are only few minutes to the non-decompression limit and therefore, unwillingly we need to start ascending!

It tries to bring you next to the reference line or to the point of exit in a small advance, or it begins your ascending with at least 70-80 bars of air still in the cylinder, so you can quietly to ascend and you will be sure to have enough air to make the safety stop.

It helps you not to reach the non-decompression limit being attracted by beautiful fish that wants to give you the famous one "last but not least" and therefore not to let you exceed it!

You ascend a little before the limit and, if your computer allows, you can continue your dive at a lower depth, anyway don't delay to leave the depth!

Signal to your partner the end of the dive, prepare to deflate the air from the BCD or dry suit to let you go up again, Remember, to avoid risks of decompression sickness it is important to respect a speed of ascending equal to 10 meters per minute or slower.

Keep the visual contact with the line/wall and with your partner and make a safety stop at 5 meters for 3 minutes.

In the case when you feel too much positive, you can use the leads that you had prepared at the base of emergency before the dive, to make the stop more comfortable.

After 3 minutes, you slowly ascend again the last meters, inflate the BCD on the surface, do not stop under the boat

ladder while the others go up and remove fins only when you have the contact with the boat ladder or with the boat, so not to have to work if you are moved by the tide.

And do not forget: "record your dive in the log-book!"



What have you learned?

The purpose of this exercise is to refresh the most important information of the Theoretical Unit, and to improve your knowledge, but also to let you be more prepared for the next appointment with your Instructor. Answer the questions choosing the correct answer from the variants, specifying if the information is true or false or writing the answer in the special space. Check your answers together with Instructor; if he would find some inaccuracies, he would give you the necessary explanations. Good luck!

1. During this course you will learn the techniques to descend safely:

- a. Within 39 m of depth.
- b. Over 39 m of depth
- c. Over the limits of recreational diving

2. Every time during the program of deep diving you need:

- a. To remember that the sea must not be challenged
- b. To establish an objective and to reach it if it is really worth to go deep
- c. Both a. and b. are correct

3. The partner system in a deep diving _____ because _____

- a. Has to be reinforced because of risk of nitrogen narcosis and when the air is finishing you ascend a little.
- b. Has to be reinforced because of light and the visibility - they are inferior and therefore it is easier to separate.
- c. Both a. and b. are correct

4. True or False

To make deep dives, your equipment should always include a spare regulator.

5. If comparing the data of your computer with that one of your partner you realize that his computer gives more no decompression time:

- a. If his is more recent, you follow that data.
- b. Follow the more conservative one, in this case yours.

c. You make an average between the NDLs of two computers and you start ascending in a few minutes before the limit.

6. The Base of Emergency should:
- a. Be located at 5 meters' depth
 - b. Be equipped with least two regulators
 - c. Both a. and b. are correct

7. True or False

In a deep dive, during the descent, it is always preferable to have a visual reference like a line or a wall and to maintain a good contact with the partner.

8. During the descent:
- a. A good habit is to go down all together, waiting everybody under the surface to verify that everything is ok before proceeding toward the established limit
 - b. It is important to agree to meet the entire group on the bottom to know if someone has problems with equalization and if other divers are ready to begin the dive
 - c. It needs to go down as quick as possible so to save more air

9. To dive with correct quantity of weights:
- a. Is dissuaded because at the end of the immersion you will be too much positive
 - b. Serves to have a good buoyancy and therefore to save energy and air
 - c. Both a. and b. are correct

10. You should begin ascending:
- a. With at least 70-80 bars of air in the cylinder
 - b. With speed not more than 10 meters per minute and to make a safety stop for 3 minutes at 5 meters
 - c. Both a. and b. are correct

I declare that I checked all the answers with the instructor ESA and that I understood the explanation to the wrong ones.

Signature _____ date _____

Chapter Two

The factors influenced by the depth

What will you learn?

As it often happens in the films, with the principal protagonist with crossing again in front of his eyes sights already seen or experiences already lived, now we will “refresh” some of the notions that you have begun to learn during the course Open Water Diver to deepen them. In fact, in this chapter, you will learn how to prevent and to manage situations like anxiety, nitrogen narcosis, pathologies of decompression and oxygen poisoning, situations, as we have already been mentioned in the first chapter, to which it is necessary to pay special attention.

To know better these problems will also mean to know how to prevent them, so you should follow the indications of your Instructor during training dives and to apply subsequently the knowledge to make more and more amusing and sure underwater experience.

The “hunger of air” or anxiety

To whom in the life it has never happened at least once to feel the anxiety?

A strong emotion or intense physical effort, in fact, can be the cause of it.

Since the elementary schools it's taught that during the inspiration we assimilate oxygen and during the expiration we expel carbonic acid.

Breathing through a regulator, or also through a snorkel, your inspiration and expiratory effort is higher in comparison with normal breathing “on land”, because the air makes a longer journey to reach your lungs.

Therefore you have a greater concentration of carbonic acid that accumulates in the dead aerial spaces (trachea, bronchi, regulator, and snorkel) and it increases your requirement of air. When your inspiration begins to be rapid and ineffective the air doesn't arrive well to the lungs, provoking a condition of

2

Anxiety can derive from fatigue, but also from a condition of psychological stress



In case of anxiety it's important to help to the partner to stay calm and to take back the control of the breathing



“hunger of air” that, as you will deepen during the course ESA Prevention & Rescue Diver, would create a condition of difficulty that, if not checked, can flow you in panic.

In the water the anxiety can derive from different reasons as for instance a situation of physical or psychological stress of the scuba diver, that's why it is important not to dive with unfavourable environmental conditions (for instance: with strong current or wavy sea).

During a deep dive you have to pay more attention to avoid anxiety because the air you breathe is denser, and exterior pressure is greater, in fact, to 30 meters (4 bars), the air will be double denser in comparison with 10 meters (2 bars).

You can begin to prevent the anxiety always starting the dive in a good physical and psychological condition; try to maintain good buoyancy, and to respect your rhythm and to breathe slowly and deeply.

Another cause of the worry could be the usage of inadequate equipment: before starting the dive you should verify that equipment is in good condition and well working, check a regulator on the facility of inspiration and on its performances in depth!

If anyway it happened to feel anxious, find a point of support:

STOP AND TAKE BACK THE CONTROL OF THE RESPIRATOR, making some long and deep inspirations. Don't try to swim too quickly to try to reach the partner.

The consumption of air

One of the factors influenced by the depth is the consumption of air, that will be greater and, considering that in

water we have neither truck stop nor stations of service whether referring to the “full” cylinders, during our deep dives we will have to prevent this problem so that not to finish the air and not to put us in a dangerous situation.

As you have already known, more deep you go, more air is consumed, because the pressure increases, it will also increase the density of the air inside

your cylinder and therefore the quantity of inspired air that you will use for every fit will be greater.

Let's take a small example:

We hypothesize that when you breathe at 10 meters (2 bars) your cylinder gives you an autonomy of air for about 40 minutes, at 30 meters (4 bars) the same one will last for the half (or 20 minutes).

To prevent this problem is really easy.

During the pre-dive briefing you agree with the partner to signal to each other the level of 150, 100 bars of air and establish the limit of air reserve that can be around 70-80 bars.

During the immersion more often check the air gauge/manometer and "give a look" also on that one of the partner: it could happen that he would forget to signal you one of the agreed limits.

You always start ascending in "advance" or, as we have seen in the chapter one, during a deep dive you should begin to ascend before you'll reach the reserve (50 bars) so to make correct ascending with calm safety stop.

In every case, always remember to pre-dispose a base of emergency at five meters with at least two regulators, so that, in case of necessity, more than one person would be able to use it.

The «Martini's affect» or nitrogen Narcosis

How many scuba divers have hoped to meet a beautiful blonde siren with the blue eyes during an immersion or a mighty Neptune... it depends on the tastes ... but if it ever happened to you and your partner doesn't correspond to the description, there are two possibilities:

you have made the discovery of the century, that would confirm theories of the Greek fiction, or you could begin to have symptoms of nitrogen narcosis.

Jokes apart, as you have already learned in the preceding theory, the nitrogen breathed in depth is of a greater partial pressure, it has anaesthetic effect because it interferes in different way with the neurons influencing impulses.

The nitrogen narcosis is easily reduced by going up for several meters

2



The effects of narcosis can be noticed around 30 meters deep, sometimes, as we will see subsequently, you can notice them even at smaller depth.

Euphoria and safety excess or otherwise careless of coordination, drowsiness, hallucinations and dizziness are signs and symptoms more frequent, but also easily resolvable..., in fact, it needs to ascend a little to let the symptoms disappear.

The narcosis is not dangerous or injurious, but it causes a reduction of the perception of scuba diver and therefore also reduces an ability of judgment.

However not all scuba divers have the same sensibility to the narcosis and even they can also be adapted to it!

During all dives of this course, the ESA Instructor will submit you to the Nitrogen Check, or, you will make a simple exercises both on the surface before the dive, and during the dive and you will notice that the time you'll have without signs of narcosis will be greater; it will be amusing to compare your time without nitrogen's influence with results of other divers of the course and especially if you will make all the anticipated immersions with difference in a few days, one from the other, You will notice the "improvements" or, for better saying, your adaptation to the nitrogen... this also will let you understand that if you don't dip for a long time, it will be better to pass some training before making the deep dive.

However there are factors that increase the predisposition to the Narcosis: the usage of drugs, alcohol, medicines (sedative) and then, unbelievable, but true, our friendly Band-Aid against the sea sickness: it contains a substance called Scopolamine that increases the narcotic effect of the nitrogen and could induce the narcosis even around 18 meters!

It is necessary to be prepared for the deep dive, and moreover, remember: always begin your deep immersion with a slow descent and with the head in vertical position.

We have already underlined the importance of a correct descending in the chapter one, in fact we have said that it serves to prevent problems of compensation and to help the orienteering, but it will also serve to prevent the nitrogen narcosis.

A slow descending, in fact, will allow you to be better adapted for the increased pressure and therefore to the nitrogen absorption, remember to be next to your partner and exchange more often with the "OK" signal, this will help you for better monitoring and, in

Minitest

1. True or False

The anxiety is characterized by rapid and ineffective breathing.

2. The way to prevent the exhaustion of the air is:

- a) To avoid deep immersions*
- b) To check the manometer more often*
- c) To avoid making divers tired in water*

3. The nitrogen narcosis can be dangerous because:

- a) It damages the cells*
- b) It causes reduction of the perceptions and therefore reduces the ability of judgment*
- c) Both a and b are correct*

Answers: 1 True; 2b; 3b.

the case that you notice something strange, stop descending and ascend to a smaller depth.

You can eventually help to your partner, if he doesn't answer the "OK", grab his hand, to let him ascend for several meters.

The main point is that the intervention is timely and that you temporize too much avoiding at the same time an unadvised and deprived action of control.

If you will avoid the factors that increase the possibility to incur the nitrogen narcosis and if you will follow the techniques that you will learn during this course with the instructor ESA, it will be really rare to find this kind of a situation, but even if it will happen, you will be able to solve it in best way!

The mysteries of the Decompression Sickness

In the XVII century, scientist Robert Boyle observing the eyes of a snake set inside a container that was pressurized for a certain time and therefore quickly depressurization noticed a bead that was formed inside. The epoch didn't succeed in giving an explanation to the phenomenon, but studies were taken subsequently as a base and soon it was clear that it was the first demonstration of the Decompression sickness.

With long time difference the causes have been opened, factors that influence you and nowadays it is a matter of study and research, with purpose to guarantee to all scuba divers the greatest safety.

Normally the percentage of breathed air is composed from around the 21% of oxygen and the 79% of nitrogen that, being an inactive gas, it isn't used by our body, therefore as "it enters" it should also have the possibility "to go out."

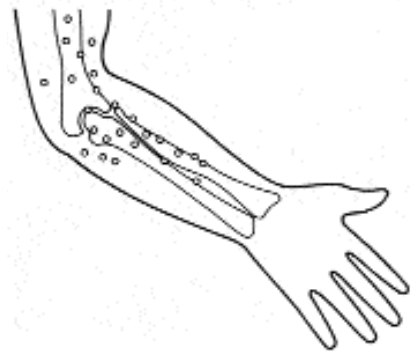
On the surface this passage is automatic but in immersion the situation is different: considering that the nitrogen is absorbed by tissues of our body in proportion to the surrounding pressure (Law of Henry), more deep we will go and more time we'll remain under water, more nitrogen will be absorbed by our tissues. Besides, the greater is the difference between already absorbed nitrogen and the breathed one, the faster will be the passage in solution and therefore the absorption.

That's why on the maps, when you increase the suitable depths, the time of immersion reduces notably and during every immersion you always have to respect these limits, to avoid a decompression stop to which you are not trained and therefore to avoid

The nitrogen is absorbed by tissues in proportion to the surrounding pressure.

The deeper we will go and longer we will stay underwater, the greater it will be the nitrogen quantity that must be delivered during the ascending

2



a risk of possible MDD.

The recreational underwater activity, in fact, doesn't foresee forced stops of decompression!

During ascending you will have to pay attention to the elimination of the nitrogen, the speed of ascending that shouldn't be higher than 10 meters per minute, and making a safety stop for 3 minutes at 5 meters depth.

The safety stop is also useful to prevent possible problems caused by beads "asymptomatic" or "silent beads", only relievable with Doppler machine, that could give origin to the Decompression sickness in particular conditions.

The tables that we use for planning our dives are ones of U.S. Navy suitable for the Doppler method.

The Decompression sickness is manifested with the formation of gas beads in tissues and, according to the place, it can provoke different signs and symptoms.

There are two forms of Decompression Sickness:

The first level, more "light", generally characterized with:

- Itch
- Prickle
- Redness
- Numbness
- Pain in the joints and the limbs

The second form, more serious, is neurological with following symptoms:

- Dizziness and nausea
- Confused speech
- Confused vision
- Different pupil diameter
- Paralysis
- Death

As you can see the risks are serious, but to avoid them it will be enough in

every immersion to respect the limits imposed by maps and computer.

Following factors:

Did you know?

*The decompression sickness also takes the name of **Bends**, because he was among the first who manifested its symptoms; they were workers that worked inside large cases to build the bridges. To reduce the pain they were in a twisted position that reminds a position of fashion among the women, called "Grecian bend". For this the workers gave him the nickname "The Bends."*

*The revealing **Doppler** was invented by M. Spencer who noticed the silent beads that stir in the blood flow and that they could be not obvious and formed after the dive. This discovery gave the origin to the actual theories of the Decompression Sickness and about the ways of removing the nitrogen from tissues.*

- Obesity
- Cold
- Illness
- Wounds
- Alcohol
- Drugs
- Work
- Age
- Dehydration
- Carbonic acid

can increase risks of Decompression Sickness, for this reason you should be always in good psychophysical form, avoid physical efforts and avoid feeling body extra cold.

After the dive, limit your physical activity, don't stay close to sources of heat (for instance, not to take a hot shower immediately), and don't take medicine or alcohol, because it can cause a variation of normal blood circulation that could rise up the symptoms of the MDD.

Besides that remember to avoid of making free dive after the normal dive, because you would recompress the present residual nitrogen in your body during the descent and, ascending quickly, the beads responsible of the MDD could be formed.

As we have mentioned in the chapter one, every time you go diving you should have on the boat, or however to your disposition, the pure oxygen ready to be administered every time when you suspect a possible MDD.

The oxygen, in fact, helps to the disposal of the nitrogen.

After the scuba diver should be transported to the medical center and eventually submitted to a recompression in hyperbaric chamber.

To get further information and to be prepared for administering the oxygen in case of necessity, you can enrol to the ESA course Oxygen First Aid and ESA First Aid.

Never try the recompression in water, could be fatal!

Or, if for some reasons you or your partner exceeded the limits and got the anticipated decompression, stay on alert of possible signs and symptoms, breathe pure oxygen, contact the medical centre and remain out of the water for at least 24 hours (or for the time prescribed by the safety rules).

The decompression sickness sometimes can reveal

Minitest

1. *The Decompression Sickness:*

- Is appearing around the 30 meters' depth*
- Is appearing with the forming of beads in tissues*
- Both a and b are correct*

2. *True or False*

To avoid the Oxygen poisoning you should just reload the cylinder from a station of reliable recharge

3. *In the situation of emergency:*

- You can intervene in whatever the situation is, because that is a moral duty*
- You can intervene if nearby there is nobody more qualified than you, but always remember about your human limits*
- You cannot do anything because you don't have the necessary training.*

Answers: 1b; 2/False; 3b.

Example of emergency plan:

*Nearest Dive Centre: XDIVE
phone. 043.009090; Radio Channel 45*

*Coast Guard: Golfo dei Granchi
phone 039.340904; Radio Channel 16*

*DAN EUROPE
phone 085/8990125*

*Recompression chamber
Doctor M. Rossi phone 357/8000005*

Police phone 113

*Emergency medical system
phone 112*

after the end of the dive!

We will deepen these aspects by examining the first fundamental steps in management of the emergency. During the last two immersions during this course you will plan the profile of the dive together with your Instructor and, you will also plan a profile for emergency together; what you will have to do for every your deep dive, if it happened to exceed the established limit, - you will have a new profile.

The oxygen toxicity

The percentage of the oxygen (21%) that composes the air breathed on the surface is used for our vital functions, but if the same one breathed at elevated depths it can become toxic, here one of the reasons why the limit of the recreational dives has been fixed at 40 meters.

There are two types of toxicity of the oxygen: pulmonary and neurological, it torments the central nervous system (CNS). The symptoms are tremors, nausea, loss of the sight, convulsions, loss of consciousness and consequent drowning. The premonitory signs are not often, and it rarely concerns the recreational scuba diver because recreational dives are not expecting to go deeper than 40 meters.

Whether to speak about that if it is the threshold of emergency below the limit fixed by the Didactic Agencies as the limit of the recreational scuba diver?

To discourage that excessive confidence that can push the diver to make deep immersions: being a good scuba diver in fact doesn't mean to reach depth record, in the contrary it means to show learned from Instructor techniques.

Often at the base of the most serious accidents, which occur at the excessive depth, there are problems of oxygen poisoning.

Remember that breathing gas mixtures with higher percentage of oxygen (nitrox) expects the limit of the toxicity of the oxygen at a smaller depth.

Always verify the content of the cylinder that you are going to use and foresee to use mixtures after proper

preparation (ESA Nitrox Diver).

Management of the emergency

In this manual, speaking about diving techniques or listing the factors amplified by the depth, we have already mentioned of what a high importance is to be ready for solving possible problems. Now we'll summarize all fundamental steps for the managing an emergency, and you can deepen the knowledge during the course ESA Prevention & Rescue Diver.

The first rule you need to fix in your memory is not to jeopardize your safety, try to be aware that your limits are human and don't act impulsively.

If you go diving with a Diving Center, the staff had already predisposed a plan of emergency, but if you will organize your dive individually, before the dive work out the plan of emergency accumulating all the information that can help you in case of an accident; the plan should include:

- Locate the VHF (on the emergency channel), or other systems of communication and useful numbers to be called.
- Predispose equipment for assistance (First Aid kit, oxygen kit, dry wear) and keep it easy to use.
- Find the medical centre in neighbourhood and get the information about how to reach it.
- Foresee your enrolment to a Medical Organisation to get the most complete form of the support that this organization can affect.

Every time you face any kind of problem, for instance pre-drowning and pathologies from decompression, you should check if the victim is breathing and to administer pure oxygen, preferably through a device on demand.

Besides that if you don't collaborate with a Diving Centre to make your dives, it's highly recommended to pass the course ESA Oxygen First Aid that will widen your knowledge in the administering of the oxygen.

To evacuate a victim from the place of accident contact the Coast Guard or eventually the Diving Center nearby and follow their instructions.

Also Medical Organisations offer their support in organizing transportation of the patients, particularly for their own associates.

Availability of oxygen kit is fundamental for managing an emergency

Translation Err

Congratulations!

Now you have completed this part of the theory for the course ESA Deep Diver, you have underlined the factors influenced by the depth, and drawbacks that have more possibilities to be revealed in a deep dive. The information about the anxiety, nitrogen narcosis, decompression sickness and the oxygen poisoning, allows you to deepen the knowledge about its' effects and causes that provoke it and to widen your theoretical knowledge, helps to improve your formation as a scuba diver so that to set more attention to each one of your dives.

In this chapter you refreshed the information about administration of oxygen and how much it is important to take it for every dive. To know more we recommend you to take the course ESA Oxygen First Aid: ask your Instructor ESA for information.

And the last assignment left for you to complete this lesson - to answer the questions in the section "What have you learned? ", using the special form sheet that you'll receive from the instructor, it will help you to improve your qualification.

What have you learned?

The purpose of this exercise is to refresh again the most important information of the Theoretical Unit, and to improve your knowledge, but also to let you be more prepared for the next appointment with your Instructor. Answer the questions choosing the correct answer from the variants, specifying if the information is true or false or writing the answer in the special space. Check your answers together with Instructor; if he would find some inaccuracies, he would give you the necessary explanations. Good luck!

1. To avoid the anxiety you should:
 - a. Dive only in case of favorable environmental conditions, use suitable equipment, maintain a good buoyancy and breathing slowly and deeply
 - b. Avoid using the snorkel or the regulator on the surface
 - c. Both a and b are correct

2. In a deep immersion it is easier to feel anxiety because:
 - a. The air that you breath in depth is less dense than the air breathed on the surface
 - b. The air that you breath in depth is denser than the air breathed on the surface
 - c. The air that you breathe in depth is less dense than the air breathed at a smaller depth

3. Your partner signals you 70 bars of air left and your computer shows 10 minutes of NDL, what will you do?
 - a. You interrupt the dive and move yourself to a safety stop
 - b. You continue the dive at an inferior depth
 - c. You signal that you'll arrive later

4. The Nitrogen Narcosis _____ and its symptoms will disappear_____
 - a. Can appear around the 30 meters of depth / after a hyperbaric treatment
 - b. Can appear around the 18 meters of depth or at a greater depth / while descending
 - c. Can appear around the 30 meters of depth / during ascending to a smaller depth

5. Slow descent and a good psycho-physical condition are able to prevent:

- a. The Decompression Sickness
- b. Nitrogen Narcosis
- c. Both a and b are correct

6. True or False

The Band Aid for the sea sickness can provoke effect of nitrogen narcosis at rather low depth

7. True or False

Signs and symptoms of the Decompression Sickness can also appear after some time after ascending.

8. To prevent the appearing of MDD it needs _____ ascending _____

- a. To avoid deep dives / with maximum speed of 16 meters per minute
- b. To avoid exceeding the limits foreseen by the dive table / with a maximum speed of 10 meters per minute
- c. To avoid exceeding the limits foreseen by the dive table / with a speed of 10 meters per minute or less

9. To dive over the limits of the safety is relatively risky to:

- a. Decompression Sickness
- b. Oxygen Poisoning
- c. Both a and b are correct

10. True or False.

Whenever an underwater accident happened with symptoms of drowning or pathologies from decompression, you should administer pure oxygen 100% and to transport the victim to a nearby medical center.

I declare that I checked all the answers with the instructor ESA and that I understood the explanation to the wrong ones.

Signature _____ *date* _____

Open Water Dive 1

Briefing

Listen the description of the activities and ask questions for possible explanations.

The briefing before the open water training dive is particularly important because it is not convenient to ascend during the immersion or to go out of the water to clarify something. It is better to listen with attention, to go down and to enjoy the deep dive in relaxed environment to increase your comfort, fun and safety. The instructor will explain you what you will have to do, where and when. Don't hesitate to ask questions if something is not clear, the instructor or the Diveleader will be happy to help you.

Preparation, wearing and checking the equipment

Prepare correctly all the necessary equipment for the dive, wear it with assistance of the partner and check it reciprocally.

You can assemble the BCD and the regulators to the tank and check that cylinder is full. Wearing the equipment could be both on the boat and in the water; it depends on the type of the boat and if you're able to put it on in water. The verification of the equipment is of extra importance to prevent tied up problems, and it's important to follow the correct order. You have to take care of this phase and to signal to the instructor or to the staff if you or your partner noticed problems with some components of the equipment. To remember the procedure of control you can use this sequence:

BCD, cylinder valve, air, weights, individualizing of the spare regulator and checking the regulator.

Entry

Enter water with the suitable technique that depends on characteristics of the place.

The instructor and the staff will give useful instructions for a correct entry to the water; the entry depends on characteristics of the place and the boat.

Descend

Descending along a reference within a maximum depth of 30 meters

Go down with negative buoyancy using the reference line or a wall, correct the speed of descent with the help of the BCD and stop in neutral buoyancy before touching the bottom or before reaching the maximum depth of 30 meters.

Controlled descending is an important phase of the dive. Particularly, to be able to stop in case of necessity, if you'll have problems with equalization, if you'll feel some effect of nitrogen narcosis or not to lift sediment in proximity of the bottom.

You will plan this dive together with your ESA Instructor at a maximum depth of 30 meters, therefore often check the depth gauge while descending and communicate with Instructor.

Use your experience in scuba diving in depth, use signals and control the data of time, depth and air consumption.

To practise experience in depth during the underwater trip you should frequently check time, depth and air consumption and signal to your partner or to the instructor.

Nitrogen Check (Verification of the effects of the Narcosis) **In depth, perform simple exercises for logic and mobility signalled by the instructor.**

A simple exercises offered by the instructor will serve you to verify the complete lucidity that during a deep dive could be partially jeopardized by the effect of the nitrogen.

Ascending along a reference and safety stop

Ascend slowly (10 meters per minute or slower) along a reference; and at the depth of 5 meters make a safety stop for 3 minutes.

It is important to ascend slowly and to make a safety stop in all the immersions, especially, in a deep one. In this way you will increase your safety towards the MDD and will remove more nitrogen from your body. The instructor will give you all necessary instructions to affect the safety stop correctly.

Exit

Go out of the water applying the techniques suggested by the instructor.

Disassembling and caring of the equipment.

Disassemble and take care about the equipment is of great importance when you plan a deep dive, it is fundamental for checking that everything is in perfect efficiency.

This phase serves to maintain the efficiency of your equipment. If there is chance, it is better to rinse it by clean sweet water before disassembling; if this was

possible, put it back with care in your knapsack or to the basket to rinse it after the indications of the Staff.

Debriefing

Listen comments of the instructor.

Here is another occasion to improve your diving skills! You discuss every activity and listen with attention comments about your performance, suggestions and recommendations of your Instructor and the staff. Take advantage to improve subsequently your skills and do not hesitate to ask questions!

Registration of the dive

Register the dive in the logbook and let the instructor sign it.

It registers the dive! This operation serves for confirming your experience in open water. You write down carefully all the parameters, environmental conditions, temperature and add your personal comments. Remember to confirm the dive with your Instructor and ask for stamps or particular stickers that you can affix on your book.

Open Water Dive 2

Briefing

Listen to the description of activities and ask questions for possible explanations.

Planning the profile of emergency.

Every time you plan a deep dive you will also have to plan a profile of emergency, or to plan the immersion to the depth higher than established one.

For example: if you decided to make the dive at 33 meters, you will have a non-decompression limit equal to 15 minutes. The suitable depth on the map is 36 meters to which the non-decompression limit is 10 minutes.

Checking this second profile will help you a lot, if you will exceed the chosen limit you will have some new parameters to follow without taking the risk to go out of curve.

Preparation of the base of emergency at 5 meters' depth

When you make a deep dive it is better if you can count on a base of emergency at the depth of 5 meters, to be able to make a safety stop comfortably at the end of every dive.

Prepare an air tank with an octopus or however with

two climbed regulators (so in case of necessity your partner would be able to use it also) then measure 5 meters from the surface and fix the extremity to the boat, or to the base of support on the surface and the other to the air tank valve. You open the faucet and you let air enter inside hoses and then close it again to prevent losses of air in the case when the system has a free flow.

Preparation, wearing and checking the equipment

Descend with a reference within a maximum depth of 39 meters, stop in neutral buoyancy with the signal of the instructor and check the base of emergency (only if conditions allow that).

During descending your Instructor will signal you to stop at established depth: when stopped you should be in neutral buoyancy.

In the deep dives it is important to be able to control descending and to stop at any moment.

Generally, during descending it would need to check if the cylinder at 5 meters is fixed well. This exercise will be done only if you dive from the anchored boat or with a station of support in fixed surface. In fact, in some places (ex. Maldives), the boats are not able to anchor and therefore the base comes “freed” in water only at the end of the dive when the instructor will point out the beginning of the safety stop, letting the signaller to emerge (surface buoy)..

Scuba diver should control and compare data from instruments with the partner and to signal 150, 100 and 70 bars (if you don't finish the dive before).

Nitrogen check

In the depth the instructor will point out names of 2 organisms typical for the zone, writing them on the white dive board, during the safety stop you will have to write the names that you had read in depth, without copying them but trying to remember them to memory.

Ascending

At the end of your dive, you will have to ascend slowly (10 meters per minute or slower) along a reference and to stop at 5 meters for 3 minutes. During ascending unload the extra air from the BCD or from

the Dry Suit, so to be always in neutral buoyancy. You have to be able to stop easily at any moment during ascending.

Safety stop, simulation of exhaustion of the air and usage of the base of emergency at 5 meters.

Once reaching 5 meters make a safety stop, together with your Instructor you will simulate the exhaustion of the air therefore, after having signalled the lack of air, catch one of the regulators of the Base of Emergency, open the faucet of the cylinder and breathe from the backup regulator for the time pointed out by the instructor.

Exit

Go out of the water with the technique pointed out by the instructor.

Disassembling and taking care of the equipment

Debriefing

Your Instructor will make comments about the dive that will help to improve your skills. Listen to the suggestions of the instructor and ask questions if something is not clear.

Record the dive in the log-book!

Open Water Dive 3

Location and control of the operation with: VHF, Kit of first Aid, Oxygen.

As you have learned in the theory related to the management of the emergencies, every time that you will dive you should have this equipment.

Individualize it, check if everything is in order and perfectly functional.

Preparing of the base of emergency at 5 meters and wearing the equipment.

Descend with a reference within a maximum depth of 39 meters, stop in neutral buoyancy by the signal of the instructor and (if possible) control the base of emergency.

Follow the data of your instruments, control and compare it with the partner's data and signal 150, 100 and 70 bars (if the dive is not

finished before) and maintain the limit established by the instructor for at least halves the time foreseen by the NDL for that depth.

The greatest difficulty that scuba divers generally meet is to maintain the pre-arranged limit. In a deep diving this aspect should be strengthened so to avoid exceeding the limits of non- decompression.

Nitrogen check

In depth, you will have to perform simple exercises for logic and mobility signalled by the instructor

Ascending mantaining a correct buoyancy control

At the end of your dive, you will have to ascend slowly (10 meters per minute or slower) along a reference and to stop at 5 meters to simulate the decompression stop.

Simulation of a decompression emergency should last for 10 minutes at 5 meters depth next to the base.

If you exceeded the anticipated NDL for pre-arranged limit for less than five minutes you should make an emergency stop for 10 minutes at five meters.

This exercise is not made for training you to the decompression, on the contrary to discourage the excessive confidence with the depth and to let you understand that emergency stops are not too much amusing and that it can often happen that there is not enough air.

When you will arrive to the base of emergency, you will stop for at least 10 minutes, using the air from emergency cylinder for last three minutes.

Exit

Go out from the water using the technique pointed out by the instructor.

Disassembling and taking care of the equipment

Debriefing

Your Instructor will make comments about the dive that will help to improve your skills. Listen to the suggestions of the instructor and ask questions if something is not clear.

Record the immersion in the log-book!

Appendix

Translation Error.

ESA

ESA is an International Training Agency its main objective is education and training of scuba divers from the first level up to the highest professional ones and the promotion of all activities related to scuba diving. The operative standards applied by ESA are the most updated ones in order to make the students to be trained in the safest environment. The training process developed by ESA takes into account the integration of information provided by the Instructor and the tools released to the students for each course, such as this manual. The initial training starts with the development of scuba diving skills in a swimming pool or delimited water, and a subsequent review and improvement of the same skills diving in open water. A student participating in any ESA program or course should prove his knowledge completing a test that will be corrected by the Instructor. Copy of such test should be kept by the Instructor. Thanks to ESA, the divers can start from the base of their training process such as the Open Water Diver course and continue to the highest levels such as Diveleader, Instructors and more. They can specialize in other branches of scuba diving activi-

ties, such as biology, photography, archaeology, etc...

The divers that have obtained the necessary certifications may participate to the courses for professional divers.

The ESA highest standards for the training of scuba divers are applied to the courses for professional divers too, starting from the ESA Diveleader course.

The ESA Instructors are trained by ESA IC Directors. The latter have specifically trained and are qualified to teach the future Instructors all needed teaching techniques. The training of an Instructor is the most complete. It includes but is not limited by information about scuba diving principles and theory, ESA procedures, principles of psychology and marketing, management of single divers and group of divers, solution of problems, and protection of environment. The licenses released by each Instructor are validated by the headquarters of ESA and/or by formally authorized ESA offices.

The ESA Training Department deals with training, and keeps ESA affiliates informed about changes in existing procedure and/or introduction of new ones. Qualified commercial firms operating in the field of scuba diving such as clubs, stores and diving centers, can affiliate to ESA, becoming ESA Points. Those firms able to organize and hold courses for the training of new Instructors are called ESA IC Points.

ESA is also specifically involved in the spread of information related to the environment, in order to improve the quality of each dive and train divers aware of the importance of the underwater life. Indeed, information and concepts about the environment and its protection are integral part of the training of all ESA professionals. This makes sure that the protection of the environment is duly taken into account in all the steps of the overall ESA training process.

9 suggestions for the Environment Care

Using the following suggestions; you will contribute in safeguarding the environment.

- 1)** Always dive in neutral buoyancy; avoid touching the seabed and the underwater organisms: you will be more careful if you dive without gloves and don't touch anything.
- 2)** Stop to move hands and fins when you are close to the bottom and, before moving, check that your knees and fins don't cause any harm.
- 3)** Avoid passing under vaults or caves: you may hit and damage the organisms and the entrapped bubbles of air can damage the environment.
- 4)** Don't hang on turtles, big fish, sea mammals, but swim with them. Don't chase the animals if they look disturbed.
- 5)** Avoid touching organisms that you don't know or that look delicate; don't touch fish or other organisms, you may take the protective mucus that covers them and cause harm.
- 6)** Don't collect dead or alive organisms from the bottom, archaeological finds and objects covered by weeds or animals.
- 7)** Don't buy souvenirs manufactured with materials from the sea: you will discourage people from collecting them.
- 8)** Don't throw anything in the water (rubbish, cigarettes' ends, batteries, bottles, paper, food, etc): use the apposite containers.
- 9)** Continue your training; get a deep knowledge of the aquatic environment: you will discover that each place deserves a dive and that there is an extraordinary variety of organisms to be discovered everywhere.

All the inhabitants of aquatic environment and occasional visitors thank you for your commitment.

9 rules for the safety

1 Keep your equipment efficient. *Check it before leaving for your holidays and diving.*

2 Be physically and psychologically fit. *Physical training and a proper diet make you enjoy scuba diving more. You can be psychologically fit preventing stress and anxiousness reviewing the exercised you learned during the Open Water Diver course, especially if you have not been diving for a while. Make sure you are hydrated, warm and rested enough when you dive.*

3 Dive respecting your experience and training. *It could happen that you dive at depth you are not used to, with strong currents, or cold water or with low visibility, therefore, make sure you get properly trained before.*

4 Plan your dives and respect the plan. *Imagine the potential risks, how to prevent them and deal with them. Agree with your mate the maximum depth and time, direction to keep and signals to use.*

5 Check you instruments and have a good safety margin. *Depth, current and physical stress influence your air consumption. Be more conservative than the limits established by computers and recreational dives planners.*

6 Breath continuously and deeply, relax and enjoy your dives. *When you feel tired or breathless, calm down and breathe, everything will be all right. You may slowly ascend to the surface if needed. Stress and breathlessness increase your breath rate and can reduce the performance of your regulator.*

7 Don't dive you don't feel like doing it. *Being able not to dive if is an enviable quality and the best way to avoid problems that you may not feel able to solve*

8 Ascend slowly and make the safety stop at 5 meters. *It is the best way to avoid the Decompression Sickness.*

9 Wait for 24 hours before flying or going on a mountain after scuba diving activities. *It is useful to prevent the Decompression Sickness.*

Scheme for planning the dive

General planning

- Dive partner
- Date and schedule of the dive
- Purpose of the dive
- Selecting the place
- Alternative place
- How to reach the place
- Appointment: place and schedule
- Particular equipment
- Checking weather and marine forecasts
- Verification and recharge of the air tanks
- Verification and preparation of the equipment
- Kit with instruments and spare parts
- Weight belt
- Complete Bags
- Transport
- Information about the place
- Contacts for an emergency
- Information for the one who will stay out
- Food and drinks
- Booking / Tickets
- Money

Planning on the Dive site

- Psychophysical condition
- Weather and Marine forecast conditions
- General environmental conditions
- Individualization and checking systems of communication
- Techniques and points of entrance
- Techniques and points of exit
- Partner System
- Techniques of underwater communication
- Underwater run
- Limits of depth and time
- Procedures for emergency
- Checking the equipment

In case of necessity contact: _____

Not to forget

General

ID Card
Dive Certificate Card
Log book
Bookings / tickets
Information about the contacts for emergency
Swimming wear
Sun protecting cream
Sunglasses
Caps
Windbreaker Jacket
Towel
Bathrobe
Slippers
Swimming mask
Dry wear
Food / drinks
Medicine

Equipment

Bags
Fins, mask and snorkel
Dive suit
Under wear dive suit
Hood
Gloves
Boots
Weight belt
BCD
Air tank filled
Regulator
Spare regulator
Air Gauge / Manometer
Hose of the BCD
Hose of the Dry Suit
Knife

Instruments

Computer
Integrated tools
Depth gauge
Timer
Compass
Thermometer
Maps

Accessories

- White dive board
- Fish cards for recognizing the kinds
- Pencil
- Boa with dive flag
- Signaller for the surface
- Reel
- Main torch
- Spare torch
- Strobo
- Light of position
- Moschettoni
- Liquid anti-fog
- Small rope for the equipment

Spare equipment

- O-rings
- Air Tanks
- Weights
- Starps
- Utensils
- Kit to mend the dive suit

Particular equipment

- Photo camera
- Objectives
- Flash
- Film
- Video camera
- Underwater case
- Cassettes
- Illuminators
- Batteries
- Batteries Charger
- Connection wire

Notes

