



7th Edition.
July 2009

TECHNICAL COMMISSION Newsletter

Dear Friends,

Introduction

Welcome to our seventh edition of our newsletter, I hope you will find some items of interest in it. This is the first letter since the CMAS elections in Phuket and there are a number of changes in our Technical Commission (TC) membership. Firstly let me thank the members of the previous TC for their commitment to CMAS and for the large quantity of personal time they spent and great work that they achieved over the last four years. Secondly I would like to welcome the new members who show great potential and are willing to work. The details are as follows:

The New CMAS TC for 2009 - 2013

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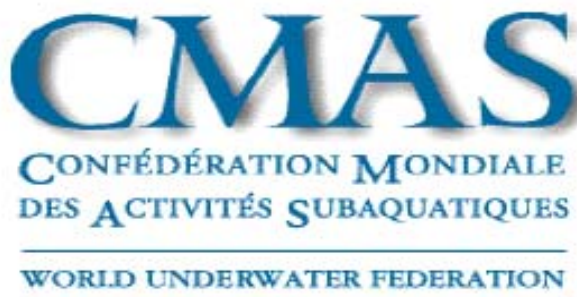
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Also in this newsletter is an account of the work achieved over the past four years. This information attachment was provided to all Federations prior to the General Assembly. If there is any part of it that you have questions on then please contact one of the TC members, via your Federation Head Office.

During the last BoD meeting the new Dry Suit and new Ice Diver standards were ratified and can be seen on the TC Web page with the rest of our diving Standards. One of the tasks of the incoming TC is to review all standards that are currently promoted by CMAS to ensure that they are technically correct and that they all integrate well together. The standards that we are currently working on are Wreck Diver, Rescue Diver, Drift Diver, Night Diver, Diving at Altitude and Navigation. Some of these already exist but may need to be updated in their content.

Another area of concern is with our teaching material and the delivery of our courses. Our intent is to assist any Federation that currently do not have the expertise themselves and we will send a CMAS Staff Instructor to them to assist in giving the initial courses if requested.

In this way we can build the expertise within the Federations and promote card sales, which in itself promotes the authority and expertise of CMAS worldwide. For this to happen I need the names of Senior Instructors who would be willing to assist. Please send the names of interested instructors complete with a Diving CV to me through your Federation President/Chairperson, they will then be reviewed by the TC and ratified if all is well.

During the last General Assembly I was asked to organise another Instructor Forum. These were organised in the past with varying degrees of success. If there is sufficient interest we will organise one in central Europe. So if you are interested in sending Instructors please reply back to the TC secretary or me, stating how many instructors your Federation will be sending, if one were to be organised.

We are attempting to create a directory of all Federation Presidents/Chairpersons and National Diving Officers, if you have not already done so please send your contact details to Stéphane Luchmun at manager.ms-da@intnet.mu if we have this information we could then very easily issue a mail shot to all giving much needed information. Lastly if you have any question of a technical nature or some issue you would like us to investigate or carry out some work on then please contact one of the

TC and we will progress it.

Best Regards and Safe Diving

Kevin O'Shaughnessy, CMAS T.C. President.

Other New CMAS Standards

The undisputed advantage of the use of the Nitrox, the didactic, theoretical and practical experience acquired in past years and the easy availability of Nitrox in many dive shops and dive centres, safari boats etc. has made it very popular. The CMAS Technical Commission (TC), keeping in mind this popularity, has been working on this issue and has the pleasure to introduce a new set of Nitrox Diver Standards.

The new standards have been approved by the BoD. Now the documentation will be published and available on the CMAS web-site.

With this new version the TC wishes to further promote the use of the Nitrox from CMAS One Star diver upwards.

The Extended Range Nitrox standards are already introduced and published on the web, along with the use of such mixtures, the blending of gases by skilful and well-trained, technically interested divers has also become more and more popular. To make the training of gas blenders more suitable to the new demands of use, the CMAS TC has therefore introduced two new standards:

1. Nitrox Blender, and
2. Trimix Blender

To go along with the demands and the development of the modern diving business, the TC has also set New Standards for Underwater Scooter training, which is a little understood skill.

The TC has defined three levels of Scooter Diver specialization (Rec, Tec, and Overhead-Environment). These Standards have accepted by the BoD and the documentation is now available.

It is important to know and understand that on all the courses, no matter which level is being sought, the trainee must have acquired the relevant entry level training and qualification beforehand; this is mandatory for all courses including scooter training.

The development of PowerPoint slides and other training aids such as a training DVD is under-way and material should be available shortly.

Best regards and Safe Diving

Leo Troiano & Beat Müller

Diving Related Articles of General Interest

Dear Friends,

In this issue I've included two articles that I hope you find interesting and relevant to modern day diving: PFOs and Corrective Eye Surgery:

PFOs (shunt/by-pass) and the Diver

Introduction

The US Space Agency NASA nearly lost a mission because of a PFO, and there have been five NASA cases of decompression illness in space! That's right, not UFOs, PFOs. Many doctors have yet to make the connection between PFOs and people under pressure - and that means not only astronauts but divers.

PFO stands for Patent Foramen Ovale. Translated from Latin, patent = open; foramen = aperture and ovale = oval, so a PFO is an oval hole, with a flap, between the right and left top chambers of the heart, or atria.

Which is right and which is left? The human body is usually described from the patient's point of view.

A PFO is a remnant from our time in the womb. Before birth, before our lungs are used for breathing, oxygenated blood supplied by mum bypasses the lungs by flowing from the left to the right atrium.

At birth, the foramen ovale should close and seal, but in a number of people it doesn't seal fully. Some of these PFOs require surgery; most do not. Some 25-30% of people are thought to have a PFO, which of course includes divers. In normal life a minor PFO causes no serious problems, but for some divers under certain conditions, large PFOs can become problematic.

During any ascent from 10m and below on air, bubbles are formed. These are washed with the venous blood into the alveoli of the lungs. They become trapped here, then, almost instantly, dissolve out, releasing their excess nitrogen and other gases to be breathed out in the normal way. It is the supply of micro-bubbles (MBs) that is important. MBs arriving at the lungs reach their peak in numbers within 15-20 minutes of surfacing, and then diminish in three broad reducing waves over the next 180-200 minute, see Fig 1, see overleaf.

Poor ascent control can overwhelm the pulmonary system with micro-bubbles, leading to DCI. The lungs, which catch MBs, are sometimes referred to as the "pulmonary filter". Bubbles are seen by

This graph shows the micro-bubbles delivered to the lungs following a 25-minute, 30m dive.

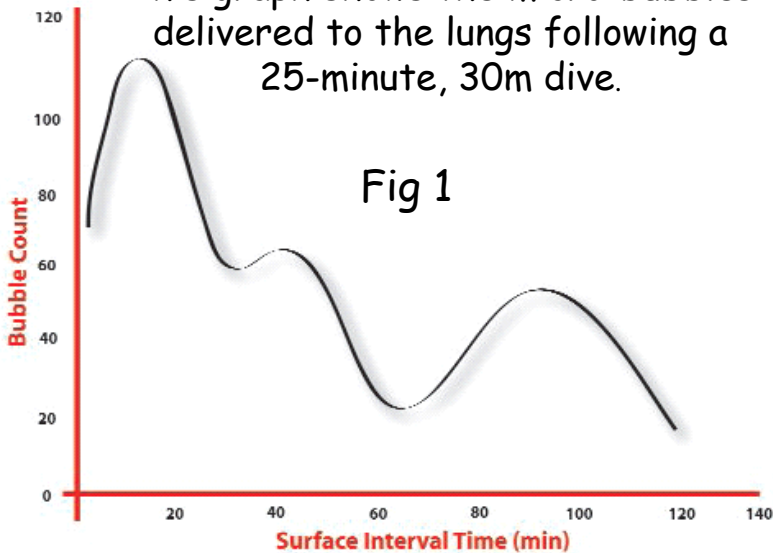


Fig 1

Blood and any debris (clots, bubbles etc) may then flow through this opening, by-passing the filter of the lungs and entering the arterial circulation. Crossing blood clots can lead to a stroke; crossing bubbles can cause DCI.

Antonio-Maria Valsalva (1666-1723)

Antonio-Maria Valsalva was an Italian physician and anatomist who studied the ears. He coined the term "Eustachian Tube", and described the aortic sinuses of Valsalva in his writings, published posthumously in 1740. In a Valsalva Manoeuvre (VM), a person tries to exhale forcibly with a closed windpipe so that no air exits through the mouth or nose - as, for example, in strenuous coughing, straining during a bowel movement, or lifting a heavy weight. Divers use VMs to equalise middle-ear pressures during descent, by pinching the nose and blowing to open the Eustachian tube. Valsalva actually described the technique as a method of expelling pus through a perforated eardrum.

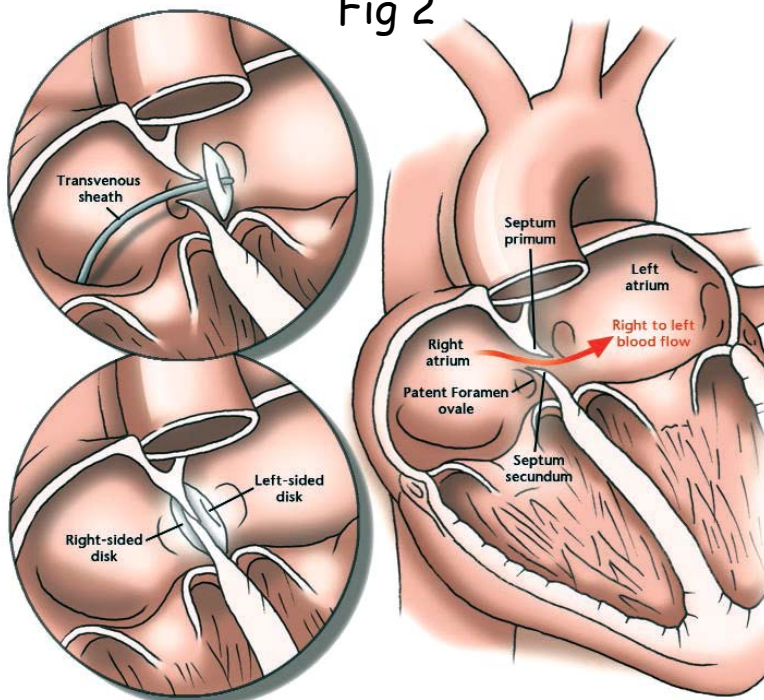
For over 18 years I've been trying to persuade divers to clear their ears without using VMs. I first published this advice in my book **Decompression and Computer Assisted Diving** (1993). A number of divers, including trainees, say that they can clear their ears only by using VMs, to which I say, keep practising. If used, VM ear-clearing must be "gentle", but how many times have you seen someone hanging on a line, pinching their nose with the other hand and blowing like hell? Usually, this approach simply causes the Eustachian tube to lock up but, more seriously, it could well open any lurking PFO. This is not an issue on the day's first dive, but may be important on dive two and three, if residual micro-bubbles are present!

As well as the 25-30% of people with a PFO, Divers Alert Network (DAN) estimates that least 10% of folk have a right-to-left pulmonary shunt (arteriovenous pulmonary malformation). Normally, the lungs filter out micro-bubbles, which get stuck in the very small capillaries of the alveolus, but in these people a section or sections of these alveolus blood vessels are big enough to allow normal MBs to pass through.

PFOs may be Dynamic

In a recent study by DAN Europe, a group of divers were re-tested after a 6-8 year period and a number of changes were observed. Twelve per cent had a bigger PFO than before, a further 12% had acquired one where none had existed, and one had closed. No reason was found for the changes, but it is thought that the very small PFOs seen originally in some of the divers had enlarged over time.

Fig 2



the immune system as alien, and this may activate a response that can lead to tissue damage, wherever they are in the body. By controlling our ascents, stops and surface intervals properly, we reduce MB generation to a minimum. A PFO is not just a hole in the heart between the right and left atrium. It is more like a short tube, up to 7mm long. The flap, in the left top atrium, acts as a one-way valve that, when open, allows blood to flow from right to left only. see Fig 2, overleaf. For about 95% of the time (the cardiac cycle), the pressure in the left side of the heart is higher than that on the right.

This tends to keep the flap valve closed. However, there are times during normal living, such as during a Valsalva manoeuvre, when the right-side heart pressure can exceed that of the left.

Putting PFOs and Diving in Perspective

If you find all this alarming, remember that of the PFOs found in 25% of autopsies, only 3% are of the 10mm-plus size thought necessary to have a significant right-to-left shunt. We are not seeing high numbers of divers getting DCI from these causes. It is thought to occur only to those with the largest shunts, though this would still put around 5% of us at risk.

Mother Nature, as always, is working to protect you. Three mechanisms limit the incidence of DCI cases from this cause; the fact that the PFO is a one-way valve restricting right-left blood flow; that the one-way valve is kept closed 95% of the time and that returning blood from both veins mixes turbulently within the right atrium and is swept, with any micro-bubbles, away from the entry of any PFO.

How can you tell if you have a PFO?

Fairly recently doctors have linked some "migraines with aura" with the presence of a PFO, though this has yet to be confirmed. If you suffer from these, check with your GP and then, if necessary, with your local Hyperbaric doctor. Unfortunately, there is no non-invasive PFO testing method, and doctors won't routinely test for PFOs during normal diver medical examinations, because of the risks and cost involved. Most people with a PFO find out only after suffering an unearned DCI, particularly where a skin bend is involved. If a PFO is found it can be surgically closed, and the benefits are more than just diving-related, because patients with a PFO are also at greater risk of a stroke. However, some hyperbaric doctors feel that the risks of PFO DCI are too small to warrant concern or repair, particularly as repair has its own share of risks. Dr Richard Vann of DAN USA told me of a diver who got bent again after having a PFO repaired. Dr Phil Bryson, of Plymouth's Diving Diseases Research Centre, told me that he also has such a patient, and two others who want their PFO closures removed. So having a PFO fixed doesn't make you immune to DCI. No dive is risk-free, and closing a PFO only reduces the risk to that of a diver with a normal heart.

As there is no medical consensus on DCI and PFOs, they are not considered an absolute bar (contraindication) to diving.

Better control of micro-bubbles by means of superior dive profiles, better ascent control, decompression/safety stops at the correct depth and diver behaviour as outlined in the panel below reduce the risk. No MBs = no DCI.

I'm sure many experienced divers reading this appendix will shrug and think: I've been diving all

these years and I'm still all right. It was what happened to two of my friends that led me to write this. They had been diving for 30+ years (5000+ dives) and 12+ years (2000+ dives) respectively with no DCI problems - until recently. The first got a vestibular bend (ear/CNS - very serious) from a 24m dive that was much shorter than the allowable no-stop bottom time, with no ascent violations. The other had a very serious neurological hit from a normal, non-provocative dive profile, with extra time spent at the last stop. Later, both were diagnosed with PFOs. Even after all their years of diving experience, they had no idea of what was in store for them. One has elected for surgery, the other has not. Both have moderately changed their behaviour before, during and after diving. The recommendations below will cost you very little but may save you a lot. Think of them as an insurance policy.

Modifying your Behaviour

PFOs become less important for divers if there are fewer or, preferably, no free-gas (bubbles). Modest changes in diver behaviour can help reduce the amount of free gas and limit PFO opening and micro-bubble wash-through. Divers can best protect themselves by learning to work with, rather than against, Nature. For example, some technical divers de-kit in the water and let others do the lifting - sounds good to me! They also use many of the other techniques mentioned here. As a Minimum:

1. Maintain your hydration. Drink plenty of water and check that your urine is no darker than a pale straw colour.
2. Avoid VMs for ear-clearing - use a procedure such as swallowing.
3. Skip-breathing causes CO₂ retention. Breathe long and slowly, using your diaphragm, not your upper chest.
4. Don't dwell at depth, and ascend at 10m/minute.
5. Use deep stops to help manage your ascents.
6. Have longer surface intervals - three hours or more, the length of time it generally takes for MBs to disperse.
7. Avoid hot baths/showers and sunbathing for three hours after diving - heat promotes bubbling.
8. Avoid unnecessary carrying or lifting of heavy items for at least three hours.
9. Avoid straining during a bowel movement after diving.

If you have a PFO, and medical clearance to dive:

10. Avoid carrying too much on the boat at one

time: make two trips with heavy items or use a trolley.

11. Breathe pure oxygen for about 15 minutes with a nose-clip fitted before diving.
12. Use the richest Nitrox possible for the planned depth.
13. Treat the Nitrox as if it were air and decompress accordingly.
14. Breathe pure oxygen for about 30 minutes with a nose-clip fitted after diving.
15. For the first three hours get someone else to do your lifting and carrying.
16. Avoid deep or long dives, too many dives in one day, stage-stop diving and reverse dive profiles.

PFO Closure (*Transcatheter Closure of Atrial Septal defect*)

A PFO closure is achieved without opening the chest or heart. In effect, a special wire with a button closure (some of the available devices: Amplatzer, Starflex, BioSTAR) is fed into a vein in the groin up to the right top chamber of the heart and through the PFO. The device is released in the PFO and forms what looks like a tight cuff link, see the two circular sections in Fig 2.

Pregnancy and PFOs

Most people won't find out that they have a PFO unless they suffer a bend and only then if the attending doctor orders a PFO scan. However, there is one class of diver that is known to always have at least one PFO and may be even more and that's the pregnant woman. The number of PFOs present will depend on how many of babies are being carried. To this number we could, of course, add another: that of the mother.

Concern has centred on the foetal susceptibility to decompression illness (DCI). The foetal circulation differs from that of adults. In the adult almost all the output from the heart travels through the lungs where micro-bubbles as a result of diving are filtered out. In the foetus, circulation bypasses the foetal lungs. Any bubble that develops via either the foetal tissue or the placental tissue will travel through the foetal foramen ovale (F-PFO) into the foetal arterial circulation and embolise to the developing tissues. This could cause damage to these tissues, and if this occurs in sensitive areas such as the nervous system of the unborn child there could be significant consequences. However, there are no data regarding human foetal gas loading and the outcome of pregnancies in mothers who have been treated for DCI in hyperbaric chambers has, in the main, gone undocumented.

Conclusion

As can be seen, there is no satisfactory outcome to this dilemma. Furthermore to state the blindly obvious, foetal PFOs can't be closed! However, the risk of a foetal DCI remains a distinct theoretical possibility. Clearly, if micro-bubbles enter the foetal circulation, the baby's lungs can not filter them out. With the existence of such doubts the recommendation can only be: if you are pregnant or trying to become pregnant and you want to avoid problems that may be caused in this way modifying diver behaviour is too uncertain - refrain from diving.

Corrective Eye Surgery

Introduction

If TV adverts are anything to go by, then the number of people opting for corrective eye surgery is on the increase. If you are considering such surgery, then reads on. In any event don't rush-in, take time to consider the options and both the advantages disadvantages.

Take the time to talk to your surgeon ask how many operations of this type has s/he done and the success rate. Don't forget to tell your surgeon that you are a diver and ask the recovery time required before you can dive again.

The Need for Good Sight Underwater

Clearly you will want to see all that's going on during any dive, but it's the need to manage your dive that's of paramount importance: you must be able to clearly see all your gauges when underwater so that you can make the right decision: ie when to terminate the dive, the maximum depth of the dive, where and when to make Deep-Stops etc, etc.

Should I correct my Sight for Diving?

If you normally use glasses to read you will almost certainly need them underwater. You can have your mask fitted with either standard magnifying reading lenses in the bottom section of your mask, prescription reading lenses or bifocal lenses. Keep in mind that if you only use a lens for reading you may be able to get away with fitting only one lens; think about it, see Fig 1, see overleaf.

Some people use contact lenses. This is potentially dangerous: because if you have a mask floods the contact lenses may be washed out, leaving you unable to see your gauges! Other people opt for eye surgery. By and large this is OK provided that sufficient time is allowed for full recovery before diving again. Recovery can take some time, six months or more. Not good if you are about go on holiday

However, Radial keratotomy (RK) a procedure used to correct near-sightedness (myopia) is con-

Fig 1

Bi-focal correction, but only for one eye.



sidered unacceptable for Scuba divers. Essentially, the procedure involves making radial incisions in the cornea, rather akin to the spokes of a bicycle wheel, radiating outwards from the pupil. Apparently, the incisions may cut through the cornea to a depth of up to 90%. This weakens the cornea allowing it to flatten and so adjusting the focal length of the eye. The US Navy has banned its divers from using this procedure.

There are a number of other problems associated with RK: reduced night vision, increased difficulty with glare (such as from a wet windscreen at night) and vision changes due to pressure variations eg pressure changes at altitude (flying), and hyperbaric changes due to diving.

Whatever procedure you are contemplating, ask about the risks and disadvantages.

Finally

Be sure that your Eye Surgeon knows how your operation will be affected by diving, don't make assumptions - Ask and insist on an understandable answer. If you are unsure take a step back from the edge and think about it.

Kind Regards and Safe Diving

Bob Cole

CMAS Technical Director

Appendix 1

The TC President's Annual Report to the BoD 50th CMAS General Assembly Thailand, 2009

Introduction

I would like to begin my report by thanking everybody who assisted me with all the topics that were developed over the last four years by the TC. I need to use this opportunity to express a special word of thanks to a very hard working TC

Without their assistance all the work that has been achieved to date could not have been done. Thanks also to the Federations who invited us to their countries for their hospitality and for the assistance with the arranging TC meetings. The TC members who assisted and their responsibilities are as follows:

Name, Position, Federation and Speciality

Roland Schnell (deceased) Director Switzerland Diving Standards

Beat Müller Secretary Switzerland Cave Diving

Jean Rondia Director Belgium Children and Diving

Bob Cole Director England Technical Diving

Luigi Caravani Director Italy Special Tasks

Pere Lagrange Baile Director Spain Education

Leo Toriano Member Switzerland Diving Standards

Flemming Holm Member Denmark Diving Standards

Joan Ramon Member Spain Education

Wieslaw Wachowski Member Poland Security

Jean-Louis Blanchard Member France Diving Standards

Mikhail Shkolnikov Yaroshevsky Member Russia Special Tasks

Safety

The main motivation behind all of the work that the TC does is driven by improving diving safety. It is therefore the duty of the TC to make changes to existing standards to keep them in line with modern teaching and world trends and to create new standards when the need for them is recognised. Below are some of the changes made for the improvement of diver's safety:

- Maximum ppO₂ for bottom gas has been decreased to 1.4 Bar and for decompression gas to 1.6 Bar. This is to stay in line with all other diving associations and medical findings.
- A code of practice has been created for the use and colour coding for Delayed Surface Marker Buoy's (DSMB). CMAS were the world leaders in this field as there was no other code established. This code is written into a diving standard:
 - Red DSMB = I'm OK, I'm here.
 - Yellow DSMB = I need assistance now, emergency.
 - Red first and then yellow DSMB = I need assistance now, emergency.
- Hand signals used in diving were examined and enhanced. These new signals are on the CMAS web site for use by all.
- The maximum depth limit when diving with Normoxic Trimix is set at 60m.
- The maximum depth limit when diving with

Trimix is set at 100m.

- CMAS have developed a DeeP-Stop Decompression System based upon Prof A A Bühlmann's ZHL16B tables as the basis. Quite a number of federations have already started using these tables and the request for them is growing. The basis behind creating these tables is to stop the bubble from forming in the first instance rather than repairing the damage it causes at a later stage. This system is now available to all CMAS Federations to use if they so wish. The title form of "DeeP-Stop" is used to differentiate the CMAS system from other systems. The system is offered free of charge in its basic form with three decompression tables and one common repetitive dive table:
 - Table No 1 - Altitude 0-700-metres; final Stop at 3-metres.
 - Table No 2 - Altitude 0-700-metres; final Stop at 6-metres.
 - Table No 3 - Altitude 701-2500-metres; final Stop at 2-metres.
 - Table No 4 - The Repetitive Dive-Time Table, which is common for Tables numbers 1 to No 3.

It is for each Federation to decide if they want to use this system or not and they may also tailor the range of depth/bottom envelopes offered for use by their divers. The choice of final stop depth is for each Federation to make considering their local conditions. Also included in the basic DeeP-Stop Decompression Pack offered to Federations by CMAS are three text sections:

1. Introduction
2. Definitions
3. Worked examples

Federation may use these sections to develop their own supporting documentation and training programme. The scheme has been offered in this form to allow Federations to develop and print their own package regionally; thus allowing local control of costs. However, It is recommended that the Federations who take-up this programme use the opportunity to revise their decompression training programme and training material to enhance their buoyancy training, ascent training and buoyancy equipment maintenance training programmes.

The reason for this recommendation is that there are an increasing number of divers, world-wide, presenting to hyperbaric chambers for Decompression Illness (DCI) treatment, where the prime cause is poor buoyancy/ascent control; either relating to skills or poorly maintained Buoyancy Control Devices (BCDs) and Dry Suits.

Courses

Another task of the TC is to supply expertise to the Federations as and when they request it. Some Federations may not have the expertise themselves to start a training program and may require assistance. The formal requests have to be sent to the CMAS office on the correct documentation and it will then be given to the TC to implement. Some of the courses that have been organised and given by the TC are as follows:

Course Federation

Instructor One Star - Iran

Instructor One & Two Star - Iran

Cave Diving Instructor - France

Cave Diving Instructor - Spain

Cave Diving Instructor - Portugal

Children and diving Instructor - Norway

Cave Diving Instructor - Budapest

Instructor One & Two Star (Second time) - Iran

Normoxic Trimix Instructor Italy - (Elba)

Nitrox staff Instructor course - Mexico

Instructor One Star - India

For the moment the TC is finding it difficult to find instructors who are willing and capable of giving speciality courses. It is our wish to create a forum of instructors who are capable of carrying out this work. We are asking the Presidents of the Federations to issue us with the names of instructors willing to partake in this work. The basic requirements would be that they are in active teaching status as Instructor Three Star, be an expert in one or more specialities and to be fluent in two languages (preferably one being English). The names of suitable candidates should be sent to the President of the TC.

New Standards

Disabled Diver standard

A working group under the TC has collected material from Federations affiliated to CMAS, who have this activity in their national programme. The goal was to collect as much material as possible and combine this in a CMAS standard for handicapped diving. From the material collected a standard for Disabled Divers was created and is now on the CMAS website.

Touristic Diver

It was recognised that there was a hole in the market and that people who completed a course and did one or two dives had nothing to show for their trouble. It was decided to create this standard to fulfil this opportunity so that people who finished a course and did at least one dive

received a certificate. People of any age above 14 years can participate. This standard is with tourist resorts in mind.

Extended Range Diver

The aim of this standard is to educate divers on the additional skills required to carry out decompression diving safely. During the course candidates are taught various topics i.e. calculation for additional gas required for deco diving, accelerated decompression, equipment required, physical and physiological aspects of deeper diving and dive planning. On successful completion of this course divers are allowed to dive to 54 meters depending on the National Federation's rules.

Normoxic Trimix Diver

It is recognised that some divers wanted to go deep but did not want to carry out the full Trimix course. Normoxic Trimix is a speciality course that allows divers to descend to 60m maximum. The aim of the standard is to give candidates a clear understanding of diving with additional equipment, the physical and physiological aspects and the dive planning that is required.

Normoxic Instructor and Trimix Instructor

Standards were put in place for these grades as they had not already existed. Having these standards ensures that Instructors are trained and certified to the correct level.

Nitrox Blender and Trimix Blender

There are now two separate standards for gas blenders. The old gas blender standard was removed and split into two. The reason for separating them is blending for Nitrox is very different than for blending Trimix. The requirement to be a diver has been removed from the Nitrox Blender standard as Nitrox is readily available through dive shops and is mixed by shop employees who may not be divers whereas there is a great need to be a Trimix diver before becoming a Trimix blender.

Scooter Diver

Standards have been created to cover the use of underwater scooters. There are three levels:

1. Recreational Scooter Diver covers the very basic machines. These standards give a broad appreciation of the risks associated with them and some basic maintenance tips. These scooters are purely for recreational diving and cannot be used in an overhead environment.

2. Tec Scooter Diver deals with class 2 scooters. These scooters have a far higher reliability and cost a lot more than the recreational scooters. These scooters can be used on extended range and decompression dives. This is an advanced speciality course.

3. Overhead-Environment Scooter Diver deals with class 3 scooters. This standard outlines the subject matter for the theoretical and the practical skills required during dives with an overhead environment i.e. cave or wreck penetration.

Updating CMAS Standards

As with all things CMAS standards and rules get old with time and need to be regenerated and updated. During TC meetings there is always discussion on how world trends in diving is changing and what changes if any are required to our standards. Examples of this are as follows:

As already mentioned all our standards have been changed to include the maximum permissible ppO_2 to 1.4 bar with travel gas and 1.6 bar on decompression.

Our Cave Diver standards have been upgraded and version 4 has now been approved. This standard has been translated into the three CMAS official languages. This version included developments with equipment, training and philosophy of how to perform this recreational activity. We kindly invite any CMAS member Federations to make themselves familiar with these new sets of rules, world-wide accepted and agreed upon by all major training organisations in this field.

The Basic Nitrox course has been modified and now this course does not involve any dives. This was discussed at TC and it was felt that there was no benefit in having dives included. It can now be given as an add-on to the Diver One Star course and diving on Nitrox can be integrated into it.

The new Nitrox standards have been written and approved by the TC and are now waiting on BOD approval at their next meeting. They will be put on the website once approved.

Work Carried Out by the TC to Promote CMAS Internationally

Instructor acceptance by outside Federations CMAS has been faced with a problem of instructors who are trained with one Federation getting acceptance and teaching with another. We pride ourselves on our high standards and instructors should have international recognition. But there will be differences between Federations, language being the basic one. The T.C. has outlined a procedure as to how these instructors should be accepted and this procedure is in the technical section of the website. It outlines items such as:

- That the candidate should be fluent in the native language.
- Fulfil all requirements as outlined by the federation i.e. national laws, medical etc.
- Show proof of being an instructor with their parent federation.

- Have a letter of conformity from the president of their parent federation.
- Have a letter of acceptance by the president of the club he wishes to join.

Card sales

The TC made a recommendation to the Board of Directors that all cards being sold to the CDC's should be reduced to €10 regardless of the number of cards requested. The CMAS training CD should be included at no additional cost. This was seen as a way of promoting CMAS and getting more cards sold through the CDC's. This suggestion was accepted in totality by the BOD.

Translation of CMAS texts into Spanish and French

A project was initiated to translate the cave diving standard into Spanish and French. This work was completed and is available now for all. The children and diving standard has also been translated into the three official languages. The Spanish text of the Diver One, Two and Three Star have been corrected and is available. A special thanks to the members of the Mexican, French and Spanish federations who assisted with the translation.

Newsletters

Six newsletters have been written and circulated via the web site. A huge response was received and it is envisaged to increase production to two newsletters per year. We hope to put more useful tips for divers into them and to keep members up to date with recent changes. Any articles that people want included in future newsletters would be greatly appreciated.

Work in Progress

The work of the T.C. is always busy and does not stop. The people representing the T.C. may change for lots of reasons but the T.C. business continues regardless.

CMAS Interactive Map

A lot of work has been put into creating a CMAS training Map that can be accessed via the internet. The front page of this map will have all of the CMAS approved courses. When built one will be able to select any course by clicking on the name of the course which will bring you to the course details (i.e. what the criteria is to gain entry to that course, on passing the course what one is entitled to do i.e. depth restriction, buddy etc). There will also be a link that when selected will bring you directly to the course standard. The draft has already been shown to the BOD and they have shown their approval to continue with the project.

Blind Diver standard

This is a new standard that has been requested as it is a specialised disability with special training needs. Assistance is being received from Federations who are active in this speciality and a standard is very close to being finished. It is expected that approval will be sought from the BOD for it later this year.

Under Ice Diver

As above the Federations doing this type of activity are assisting the TC with creating this standard and it also will be ready later in the year.

Dry suit course

As above this Standard is close to being finished.

Wreck Diver Standard

This standard is in its early stages of discussion. It is seen that it is required and approval will be sought from the BOD during the next meeting to continue with its formation.

Revision of Closed Circuit Rebreather {CCR} (Helium)

Work has started in revising this standard to bring it into line with world trends. This should be ready in 2010.

Summary

In summary the TC is very active and has a very good working group participating in it. We are there to serve the CMAS members and to deliver to your requirements. If there is anything that you feel that is not getting due care or attention please let any one of us know or contact me directly and we will make every endeavour to correct it.

Finally, I need to thank the President, Mr. Achille Ferrero, The Secretary General, Dr. Pierre Dernier, as well as the members of both the Steering Committee and the Board of Directors for all the advice, support and assistance that they offered me during my term as the President of the Technical Committee. Without their support it would have been impossible for the Technical Committee to have achieved everything it did during this time.

Very Best Regards & Safe Diving

Kevin O'Shaughnessy

President Technical Committee CMAS