INTERNATIONAL DIVING SCHOOLS ASSOCIATION

iDSA NEWS

EDITION NO. 22 JULY 2013

Annual Meeting in Copenhagen

New PSA approved Closed Bell Course in Oslo

New Full Member in Ireland

The History of the Hot Water suit

DDRC Plymouth takes on new identity

A Look at Decompression

About SCUBA

INTERNATIONAL DIVING SCHOOLS ASSOCIATION
iDSA NEWS EDITION NO. 21 JANUARY 2013

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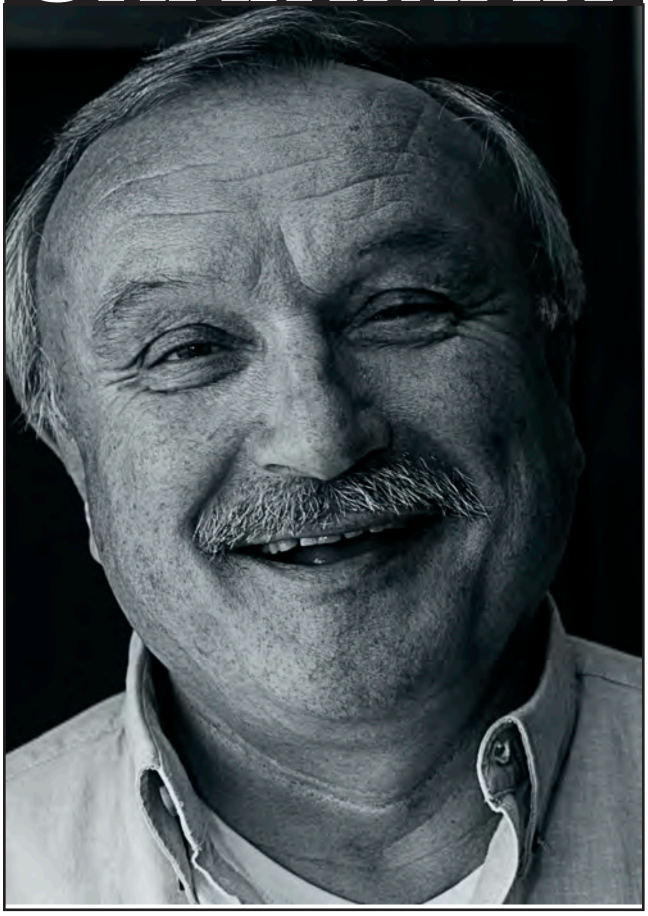
FROM THE CHAIRMAN



I would first like to welcome the Irish Navy Diving School as a Full Member and the following schools as Associate Members:

The Nautilus Dive Company: *Austria*
The Universal Marine Institute: *Egypt*
The Faroe Dive Centre: *Faroe Islands*
In-Out Security Service: *Italy*
The Arabian Marine Diving Centre: *United Arab Emirates*

The Auditing Programme for Full Members continues, and is on schedule, the latest situation is:

Audits completed since the programme began

2012: NYD, Oslo: April
Royal Danish Navy Diving School: October
2013: The Irish Navy Diving School – Level 1: March
Luksia, Finland: May

Future programme:

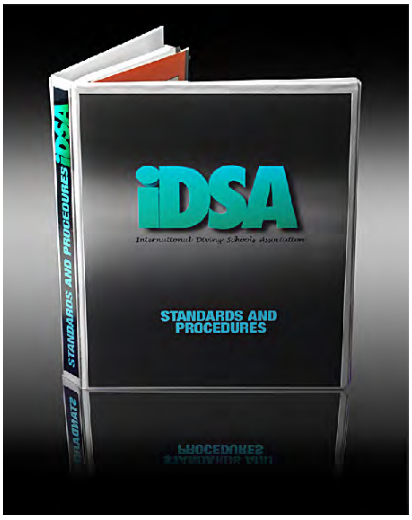
2013: The Irish Navy Diving School Level 2: August
Swedish Armed Forces: October
Farjenas, Sweden
2014: NDC, Netherlands
CEDIFOP, Italy
CFPME, Belgium
The Ocean Corporation, USA
2015: None
2016: CMPP, Morocco
2017: NYD, Oslo, and so on

Plans are also well in hand for the annual meeting, one of the main items will be to finalise the revised Standards and Procedures. The present plan is to circulate the draft by E Mail in Word format at the end of June for comment by 1 August. This will give enough time to embody comment and circulate the final draft to members about a week before the meeting, again this should give enough time for members to print the document – about 190 pages – and punch it with 4 holes to bring it with them to the meeting. At the meeting all delegates will be given a ringbinder to contain the pages. The ringbinder will also be mailed to members unable to attend the meeting.

Please also let us have items for the Agenda, and nominations for Secretary and Treasurer as soon as you can, but certainly before 1 August.

It looks as though we shall have a reasonable attendance, I look forward to meeting many of you.

LEO LAGARDE



The cover of the Ringbinder which will be given to all members.

ANNUAL MEETING 2013 COPENHAGEN 28 TO 30 AUGUST

Hosted by the Royal Danish Navy Diving School (RDNDS)

The meeting this year hosted by the Royal Danish Navy is to be held in the ancient and splendid city of Copenhagen, and the meeting itself will take place in the historic Fortress of Kastellet which is still used by the Military Administration.

Accommodation

The meeting Hotel the 'Copenhagen Strand' is some 10-15 minutes drive from Kastellet and transport will be arranged as required each day for delegates, not just to Kastellet, but also to the Diving School

The address of the Copenhagen Strand is:

Havngade 37, DK-1058 Kobenhavn K

The Room rates are DKK 995 single or DKK 1190 Double (inc Breakfast). Bookings should be made direct with the Hotel quoting reference: 1380686. Telephone +453348 9901

E Mail: copenhagenstrand@arp-hansen.dk,
Web: www.copenhagenstrand.dk

In case of difficulty please contact the Administrator at info@idsaworldwide.org

Attendance

In addition to Association Members, the meeting is open to non members as Observers. Wives or Partners wishing to attend meals and other social occasions - for example the Association Dinner - are welcome on payment of an appropriate fee. The meeting fee which will cover attendance, all transport, refreshments, lunches, and the Association dinner has been maintained at €350 (DKK 2611) per delegate and €400 (2984 DKK) for observers.

Please Note:

The Hotel Booking Form and the Meeting Registration Form may be downloaded from the News section of the IDSA Website

Tuesday 27 August

18.30 to 20.30: Registration and welcome drinks at the Meeting Hotel the 'Copenhagen Strand'

Wednesday 28 August

09.00: Bus for delegates from the Conference Hotel to the Meeting in the Fortress of Kastellet.

09.30: Welcome by Niels B. Mejlhede, Officer in Command of the Royal Danish Navy Diving School.

09.40: Meeting session 1

12..00: Group Photograph

12..20: Lunch

13.30: Meeting session 2

15.40: Bus from the Fortress to the School

16.00: Tour of the School

16.40: Visit to the RDN Diving Vessel 'Soloven', followed by a Buffet onboard.

2000: Return to the Hotel

Thursday 29 August

09.00: Bus for delegates from the Conference Hotel to the Meeting in the Fortress of Kastellet.

09.20: Meeting session 3

12.20: Lunch

14.00: Meeting session 4

16.30: Return to Hotel

19.00: Bus for Delegates and Guests to Association Dinner

22.00: Return to Hotel

Friday 30 August

09.00: Bus for delegates from the Conference Hotel to the Meeting in the Fortress of Kastellet.

09.20: Presentations:

- Hytech – Decompression Chambers
- In-Out Security Service – An interactive Video Control System
- University of Southern Denmark – Scientific Diver training
- Beat Engel – Helmet development

11.00: Closing Session of Meeting

12.00: Bus for Delegates from Meeting to Airport

HISTORY IS MADE AT THE NORWEGIAN DIVING SCHOOL, OSLO (NYD)

An historic photograph :

- The first NYD closed bell saturation (sat) course.
- The first Norwegian regular sat course since 1986, and the first sat course ever strictly commercial without any financial support either from the Norwegian government or the diving industry.
- Scheduled between 27 May and 21 June, it was treated as a 'pilot' course and on the 30th May the Norwegian Petroleum Safety Authority (PSA) carried out a full audit of the school. The result was satisfying, no gaps were found, and NYD is now authorized by the Norwegian government to teach sat courses.
- Training is based on the North Sea standard NORSOK U-100 and IDSA Level 4 Diver on graduation each successful student receives the Class-2, Bell Diver certificate issued by the (PSA), and the IDSA Level 4 Qualification Card.
- The photo shows NYD staff in the front row, and students from Norway, Sweden, Iceland and Iran at the rear.
- The students are from Norway, Sweden, Iceland and Iran.

Note: Future plans follow the policy encouraged by IDSA that Schools should combine their facilities, and so that efficiency and cost effectiveness is increased. Joint courses to IDSA Level 3 standards are to be run with Netherlands Diving Schools and those already in place between NYD and CEDIFOP (Sicily) continue.

IDSA LIAISON

Part of IDSA's role has always been to assist and advise on the development of member schools drawing on its long experience of Diver Trainingand in order to encourage members, currently, such visits are made for expenses only. It was in this advisory role that a recent visit was made to Hungary, to discuss future developments and investment at the school in Szolok. Situated approximately one hundred kilometres to the east of Budapest the school has been in existence for a number of years, training mainly in rivers including the Danube, and with good links to local contractors. The school is geographically isolated from other IDSA schools but is keen to reach IDSA standards and to understand what sort of investment might be needed to do so. The school already has good teaching facilities including access to excellent swimming pools and a lake and has a high standard of administrative back up. The school is now following up recommendations regarding equipment and record keeping in line with IDSA standards.

THE IRISH NAVY DIVING SCHOOL

A training session in the pool of the national maritime college of Ireland.

In March of this year, the Irish Navy Diving School completed the audit qualifying the school to issue IDSA Level 1 certification. The Diving School is situated at the Naval Base in Cork and holds responsibility for the training and certification of all military divers within the Irish Defence Force. The Navy Diving Unit provides the primary sub surface capability for the State. Thus, outside of routine military underwater engineering and explosive ordnance disposal tasking, the unit is regularly tasked with search and recovery, hull inspections on vessels of interest, salvage and ROV surveys on behalf of a number of state agencies.

The school teaches military divers all aspects of diving and supervision from the basic ships diving course, through to underwater engineering and salvage, clear-

Staff & Auditors During The Recent Audit

The Control Panel of the containerised Chamber during a Surface decompression exercise

ance diving operations, chamber operation and ROV pilot technician training. Before commencing dive training, each prospective student must pass a two day aptitude test, specialist diving medical and a three week physical conditioning programme, finishing with the annual Diving Physical Fitness Test.

Initial training on SCUBA, SSDE, Rebreather and ROV Equipment takes place within the National Maritime College of Ireland, the first third level college in Ireland built under a Public-Private Partnership between the Irish Navy and the Cork Institute of Technology. Both the environmental pool, 20m x 8m with a depth of 7.5m, and the cutting/welding tank, 4m in diameter with a depth of 8m, provide the ideal facility for introductory equipment specific training allowing each student to perfect their standard operating procedures and emergency procedures in a controlled setting.

The next phase of dive training is undertaken at the Naval Base, in and around Cork Harbour, teaching students how to operate safely and efficiently in strong tidal conditions and nil visibility. Qualification deep dives on SSDE take place using the schools SMP Diver launch and Recovery System.

The Irish Navy Diving School's Research and Development section operates within the Irish Maritime and Energy Cluster, (iMERC) working with such companies as Cathx Ocean LTD in the development of dive and ROV lighting and camera systems, and the University of Limerick in innovation and development of smart ROV and AUV systems.

The school will undertake the IDSA Level 2 audit this August.

ABOUT IDSA

IDSA is the only International organisation for the training of all categories of professional divers & related personnel.

Members of the association are teaching competences to the standards required by the diving industry guidelines & codes of practice for both inshore & offshore diving. These also cover the requirements of different national regulations in all professional diving categories.

There are more than 60 members of the Association worldwide, who to date, have trained thousands of working divers.

Preparing for a diver search exercise

DIVING, GAS MOVEMENT AND RIGHT TO LEFT SHUNTS

From his new book "Out of the Decompression Matrix"

Introduction

This is a book about diving and decompression, right? Yes, that's right. So why are we talking about shunts or vascular bypasses? Well the answer lies in the fact that until relatively recently there were a considerable number of cases of unexplained decompression illness (DCI). The stock answer, 15-20 years ago, was that DCI is statistically inevitable and today the bullet had your name on it!

In the early 1990s a strange new word entered the vocabulary of some divers - "PFO" (patent foramen ovale, which is a small hole between the upper two chambers of the heart). Some diving cardiologists were suggesting that this PFO was contributing to some of the unearned cases of DCI. It became a hot topic with some hyperbaric doctors disputing this claim. However, over the intervening years the concept has gained favour and nowadays it's accepted as true.

These unearned DCIs are linked to the fact that many dives created, what was called, "silent bubbles" (SBs) during the ascent. Nowadays, SBs are called micro-bubbles (MBs). It was thought that MBs did no harm, because they are, normally, filtered out by the lungs - more of this later.

Background

The foetal blood circulation is different to the adult circulation, see Fig 5.1. Don't worry too much about the detail, there's no test. This is because the job of the lungs, liver etc is done by the mother. To this end there are four shunts (bypasses) in the foetal circulation, which are the:

- Placenta - the circulation connection between the mother and the foetus.
- Patent Ductus Venosus (PDV) - The foetal liver bypass.
- Patent Ductus Arteriosus (PDA) - A bypass, outside the heart, that assists the PFO.
- Patent Foramen Ovale (PFO) - The foetal lung bypass in the heart.

Clearly, the placenta is discarded at birth and cannot affect the diver.

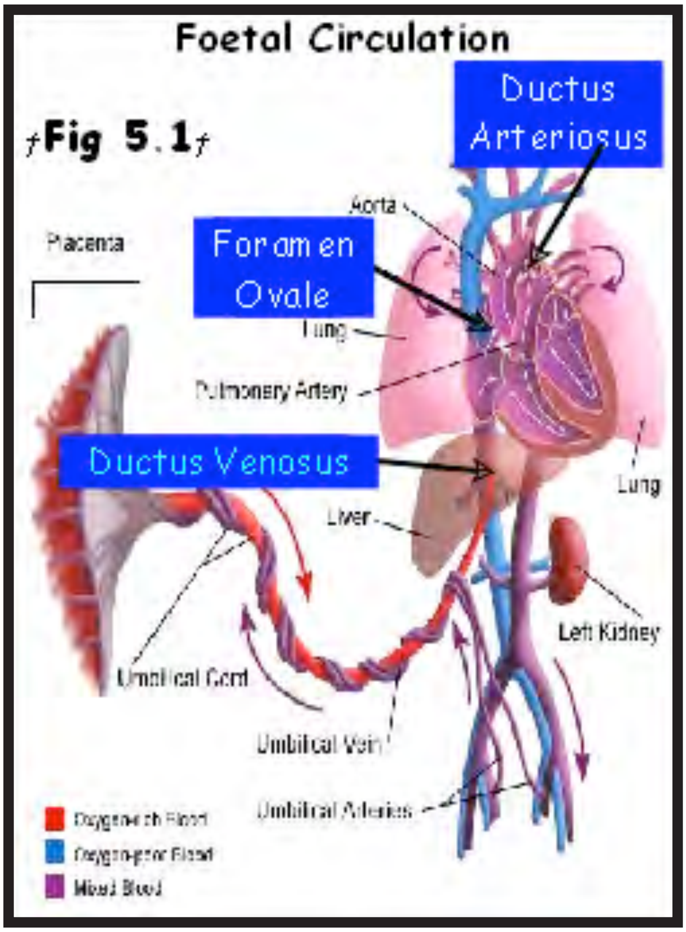
The PDV and PDA close off automatically shortly after birth, in all but a very few exceptions. Non-closures are quickly picked up by the paediatrician and corrective action taken. So, healthy divers have no problems in this regard. However, it is known that between 25/30% of all adults have a PFO. Therefore divers, as a sub set of the general population, are similarly affected. For this reason it is worthy of discussion, particularly since there seems to be some misconceptions in the minds of many divers.

PFO: To dive or not to dive?

Introduction

Even NASA has had problems with astronauts who have patent foramen ovales (PFOs) and decompression illness and had to cancel some space flights.

Not too long ago if you uttered the term PFO to any diver they'd have thought you were talking about a UFO or would have answered:



"What the . . . . "! Nowadays many more divers are aware but few have any real idea of how to deal with them or, even if they should be bothered. To be fair, many doctors have not yet made the connection between PFOs and decompression illness (DCI). Those that have are usually involved with divers.

With the information currently available to us should we not consider some amendments to our diving practices in an attempt to better protect ourselves from PFO generated DCI? This Chapter examines to a limited extent, the condition, and possible effects on divers, while some procedures to help avoid the problem are offered in the Chapter on DCI Avoidance Strategies.

To recap, a PFO is short for a Patent Foramen Ovale: A Latin term {Patent = Open; Foramen = Aperture; Ovale = Oval} for an oval hole, with a flap, between the right and left top chambers of the heart (atria).

Which is right and which is left? The standard method of referring to the human body is from the patient's point of view and not from that of the observer.

A Patent Foramen Ovale is a remnant left over from our time in the womb, just prior to birth, when our lungs are not being used to breathe and oxygenated blood etc was supplied by mum.

At birth, the Foramen Ovale (FO) should close and seal; however, in a number of people some fail to seal fully; some of these require surgery, most do not. In normal life a minor PFO causes no serious problems for the owner. However, for some divers under certain conditions, large PFOs can become problematic.

During most ascents micro-bubbles (MBs) are formed, which are washed with the venous blood into the alveolus of the lungs. Here they become trapped 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 MBs that is important. MBs arriving at the lungs reach their peak in numbers after about fifteen to twenty minutes of surfacing, and then diminish in three broad reducing waves, which shows three tissue compartments with reducing half-times, over the next 180-200 minutes, see Fig 5.2, hence the suggested minimum surface interval between dives of three hours.

Poor ascent control can overwhelm the pulmonary system with MBs, which then can lead to DCI. Because the lungs catch MBs they are sometimes referred to as the "Pulmonary Filter".

Furthermore, bubbles are seen by the immune system as alien and this may activate an immune response reaction: which can lead to tissue damage wherever they are in the body. Better to keep things under proper control.

A PFO is not just a simple hole in the heart between the right and left atrium. It is more like a short tube that can be up to about 7mm in length, with the flap at the remote end in the left top chamber (atrium) of the heart, which acts like a one-way valve that allows, when open, blood to flow from right to left only, see the overview in Fig 5.3a.

Normally, for about 95% of the time (ie the cardiac cycle), the pressure in the left side of the heart is higher than the right side. This tends to keep the flap valve closed, preventing right to left blood flow. However, there are times during normal living, ie during a Valsalva's Manoeuvre, that the right side heart pressure can exceed that of the left. At such times blood and any other debris (blood clots, bubbles etc) may flow through this opening thus by-passing the lungs (pulmonary filter) and directly enter the arterial circulation. Crossing blood clots can lead to a stroke, whilst micro-bubbles entering the arterial circulation via a PFO or AVM are then fired off around the body and end up in tissues where excess inert gas is dissolved. If the partial pressure of the inert gas in the tissue is higher than the bubble – the bubbles will grow. This is in contrast to the air bubbles injected, by a cardiologist, into a patient's venous circulation when testing for the presence of a PFO. If the injected air bubbles do indeed pass into the patient's arterial circulation, via a PFO, it quickly dissolves out. This is because the gas pressure in the bubbles is higher than the dissolved gas tension in the blood so the gas leaks out causing the air bubbles to collapse.

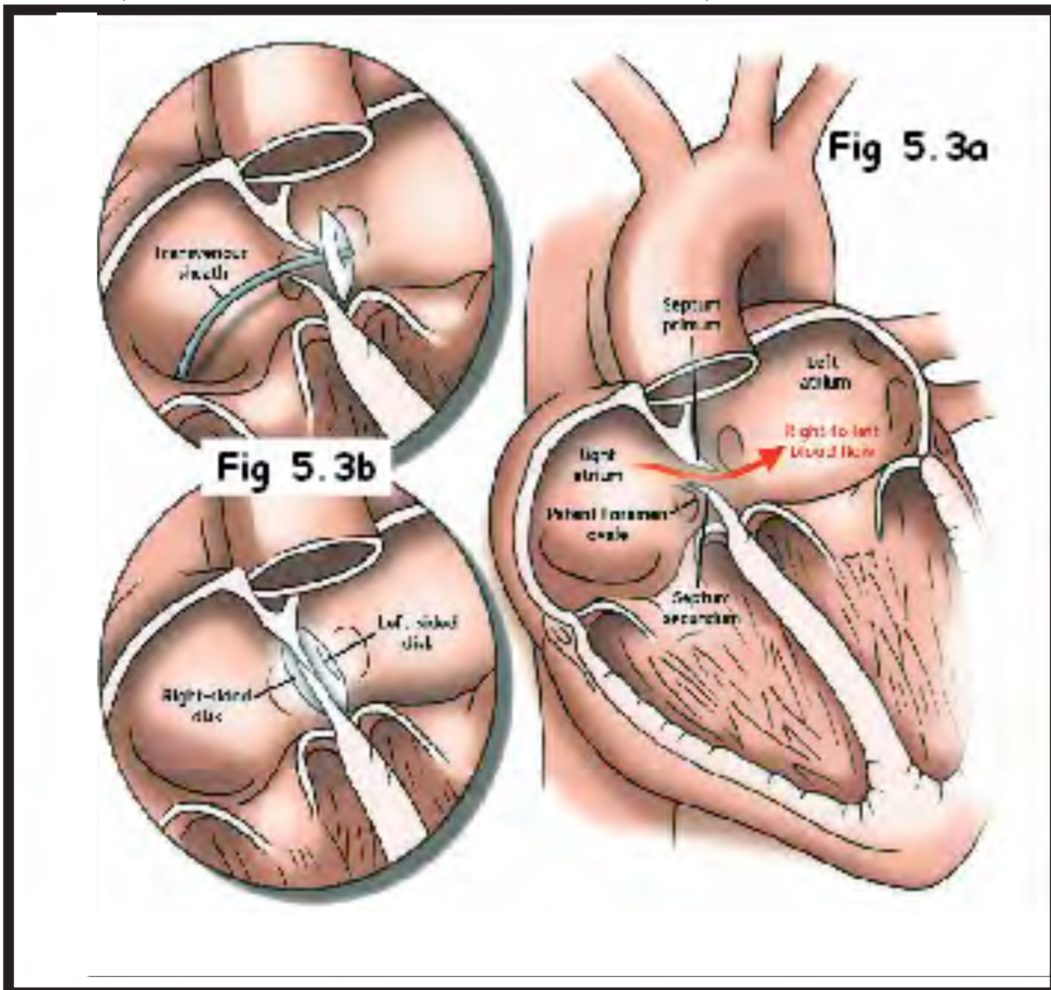


Fig 5.3a

Fig 5.3b

Antonio-Maria Valsalva (1666-1723) was an Italian physician and anatomist born in Imola. His research focused on the anatomy of the ears. He coined the term “Eustachian Tube” and described the aortic sinuses of Valsalva in his writings, published posthumously in 1740. His name is associated with the Valsalva antrum of the ear and the Valsalva Manoeuvre, which is used as a test of circulatory function - Valsalva’s Manoeuvre (VM) Definition:

A manoeuvre in which a person tries to exhale forcibly with a closed windpipe (glottis) 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. Valsalva’s Manoeuvre is seen by divers as pinching the nose and blowing to open the Eustachian Tube in order to clear their ears when diving.

For the past 20 years I’ve been trying to get students and others to clear their ears without using VM and I first published this advice in 1993 in a book called “Decompression and Computer Assisted Diving”.

A number of divers, including trainees, say that they can only clear their ear using VM, to which I’d say - some times better things take a little longer to achieve; more practise please. Ear clearing using VM must be “gentle”. By that I mean the blowing part during the nose pinch must be gentle.

How many times have you seen someone hanging on the line with one hand, while pinching their nose with the other and blowing like hell? Usually, this doesn’t work and simply causes the Eustachian tube to lock up firmly, after which other action needs to be taken. This incorrect approach could very well open any lurking PFO.

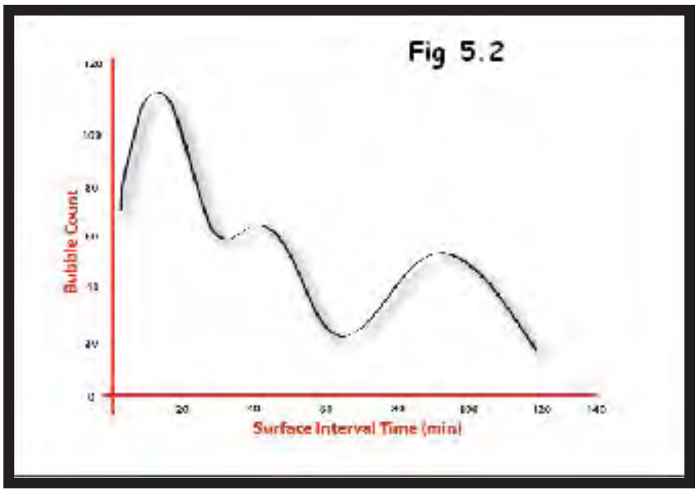


Fig 5.2

This may not be an issue on the first dive of the day, but it could become important on dives two and three when residual micro-bubbles are likely to be present!

PFOs may be Dynamic

A recent study, by DAN Europe, has shown that when a group of divers were re-tested for a PFO after a 6-8 years period, a number of changes were observed. Of those tested 12% had an increase in the size of their PFO, a further 12% gained a PFO where none had existed before and one PFO had closed. No reason was found for the changes. However, one thought is that some divers had very small PFOs when first tested, which enlarged over time. However, there are those who say this outcome is because of poor initial testing. They are, I’m told, not easy to measure.

A personal thought on this subject: I’ve been diving for many years, too many to count, and find that I no longer need to clear my ears when descending. My Eustachian tubes open automatically to relieve the pressure. So perhaps the same thing is going on with some people with a PFO and who do a job and or sport that regularly involves lifting heavy stuff. Maybe PFOs can act like my Eustachian tubes and open without too much trouble.

Putting PFOs and Diving in Perspective

If you’ve just come across this idea or find it too alarming - think again. Although it is said that 25-30% of people have PFOs, we are not seeing high numbers of people getting DCI through this cause.

It is thought that only those with the largest shunts are related to DCI.

Mother Nature, as always, is working on your side to afford you some level of protection. There are three mechanisms that tend to limit the number of DCI cases we see from this cause. The PFO is a one-way valve restricting R-L blood flow. For 95% of the time (cardiac cycle) the left heart pressure is higher than that on the right side, maintaining the one-way valve closed. The returning blood from both veins mixes turbulently within the right heart chamber (atrium) and is swept, with any MBs, away from the entry of any PFO.

How can you tell if you have a PFO?

Fairly recently doctors have . . .

The balance of this article by Bob Cole will be in the next issues of IDSA News


Dick and Susan Long diving off the coast of the Southern California Channel Islands

HOT WATER SUIT DESIGNS -THE FUTURE

By Dick Long

March 31, 2013

Using hot water to keep divers warm has been the industry standard and has not changed significantly in the last 30 years. How it is applied varies greatly on the location, depth, water temperature, type of job and regulatory environment.

Dick and Susan Long diving off the coast of the Southern California Channel Islands

Much of the job efficiency is influenced by the efficiency of the diver. If we apply the technology we have learned in other fields to the hot water suit we improve the diver's performance underwater, as well as his safety. This presentation reviews the practices and equipment used in the field today, as well as the effect of employing the advancement in design and materials when embodied in an improved suit design. At the cost per hour of a modern diving operation, such advancements can provide a worthwhile investment.

Current Practice

The common practice today when using a hot water suit is if the diver is feeling cold he will ask the surface for more hot water, not the same volume of water at a higher temperature. If the surface supervisor turns up the water volume flowing to the diver, the water will spend less time in the hose, and therefore, there will be less temperature drop. This, in turn, causes a rise in the temperature of the water entering the suit making the diver feel warmer. The same result could have been realized by turning up the water temperature flowing to him by two or more degrees. Turning up the flow rate expends a lot more energy or fuel.

The practice of using higher flow rates has reduced the need for highly insulative, specially-built and expensive hoses for bell and diver umbilicals. In the past, to breathe helium in 40°F (4°C) water, we use an injection temperature of 110°F (43°C) to achieve a skin temperature of 93°F (34°C) at a flow rate of 2½ gallons per minute. If we assume the suit holds five gallons of water we have a complete exchange of water within the suit in two minutes. If we bring the water in at four gallons per minute, the dwell time of the water in the suit is just a little over one minute. Therefore a lower injection temperature is required to maintain the 93°F (34°C) water inside the suit. If you raise the flow rate to five or six gallons per minute the dwell time is shorter, and therefore, the injection temperature is even less. If a lower injection temperature is used, for example, 100° to 105°F (38° to 41°C) then the diver is further away from an injection temperature which can cause skin damage. This also means that we can rely less on the insulative factor of the material in the suit than in the original models. There are a number of advantages using higher flow rates and lower injection temperatures. We can now use a thinner suit material and have the same operational effect. It also means that there is now more water to flush over the hands and feet with a higher flow. The temperature throughout the suit is now more uniform. The diver is more comfortable. His body can perform at higher efficiency, especially his hands.

Below is a list of shortcomings of many of the hot water suits in use today:

- Temperatures within the suits can vary a great deal depending on the type of boots and gloves used and flow rates received.
- Because of the water flow design, flow into the hands and feet can vary greatly and is not under control of the diver.
- Many of the gloves in use today reduce dexterity, sense of feel and griping capability of the diver.
- The diver experiences cold spots when braced against a structure. This displaces the water in the suit away from the diver's skin.
- When the water supply is lost, there is no way to prevent the hot water from leaving the suit and the cold water from flooding in.
- The divers' hands are the main tools with which they work; thjey need to get the most out of them.

DUI created new designs to eliminate these shortcomings. We wanted better temperature distribution throughout the suit and, most especially, we wanted to give the diver warmer hands.

Of particular interest was how to better protect the diver when the hot water supply is terminated for any reason. We learned long ago the diver becomes quite stressed from the sudden influx of cold water entering the suit. The cold becomes incapacitating. We installed a one-way valve design in the chest that keeps the cold water from entering the suit while the diver goes to his bell or other place of safety.

We applied technologies of gloves developed in other fields to give the diver a better sense of feel and gripping power. We also produced a glove system to reduce cold hands when gripping something for a period of time by injecting the water into the hands first.

We applied technologies of gloves developed in other fields to give the diver a better sense of feel and gripping power. We also produced a glove system to reduce cold hands when gripping something for a period of time by injecting the water into the hands first.

We also wanted to give the diver the greatest range of motion and to reduce the encumbrance imposed by his suit and equipment.

Listed below are some of our findings:

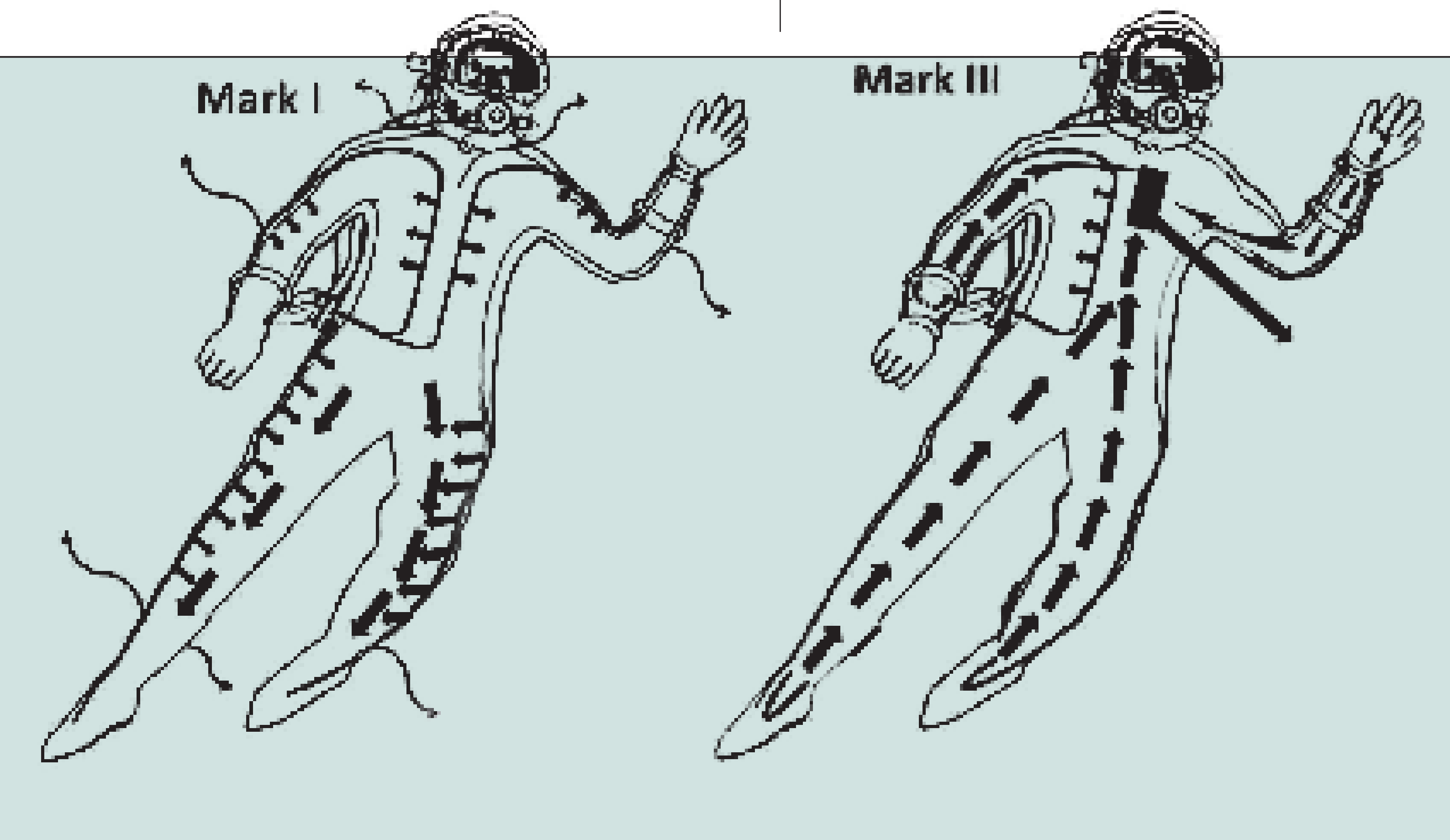
- We tested three weights of polyester fleece suit liners. We used jumpsuits that weigh 50g/m2, 150g/m2 and 300g/m2. We found the 300g/m2 material gave us the best volume of warm water between the diver and suit. The thickness between the 150g and the 300g jumpsuit did not make a significant difference once in the water. We understand that 150g or thinner is the most common used in the field today. We also tested material that stretched in two directions and material that stretched in only in one direction. We found the material that stretched in two directions gave the diver greater freedom of movement.
- We found that using a knit liner inside our glove actually reduced water circulation around the fingers making the fingers colder.
- The one-way valve system produced less than one inch of backpressure, which is about the same as the current system.

Description of the next generation hot water suit system (MK3):

- Employs a new water distribution system in which the water enters at the hands and feet, travels over the diver's body and exits at a central point that can be closed in the event of a water supply failure.
- The diver's feet are enclosed in a sock over which a wide variety of boots can be worn depending on the job requirements.
- The new glove attachment system allows a wide variety of common work gloves to be secured, giving the diver a firm grip and easy interchangeability.
- The suit is equipped with a main exhaust point with a one-way valve that prevents outside water from entering the suit should the water supply fail. It has a cover that seals it shut when manually activated.
- The new suit is made of CF200 material (crushed neoprene) that is 1/3 the thickness of the original suit but has the same toughness as the original DUI hot water suit material.
- The new control manifold can adjust the flow rate into the suit by 50% and is field-serviceable for easy cleaning. The new suit folds up much smaller and can fit through a smaller medical lock.
- The suit is equipped with two leg zippers which can be opened when exiting the water to quickly drain the water from inside the suit.

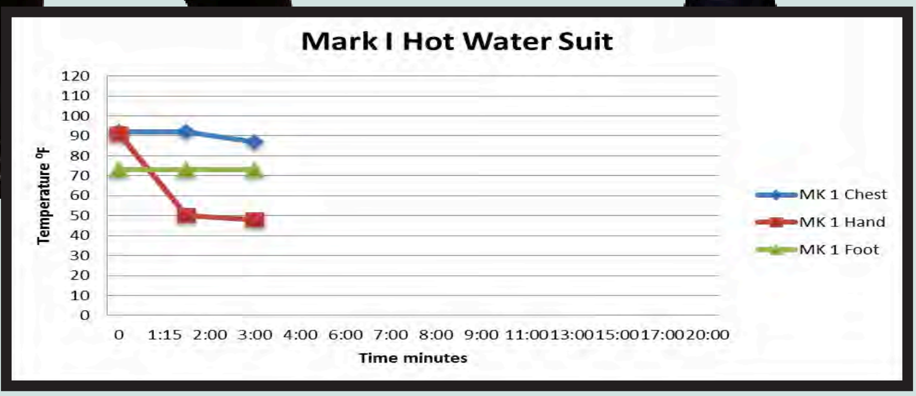
Safety

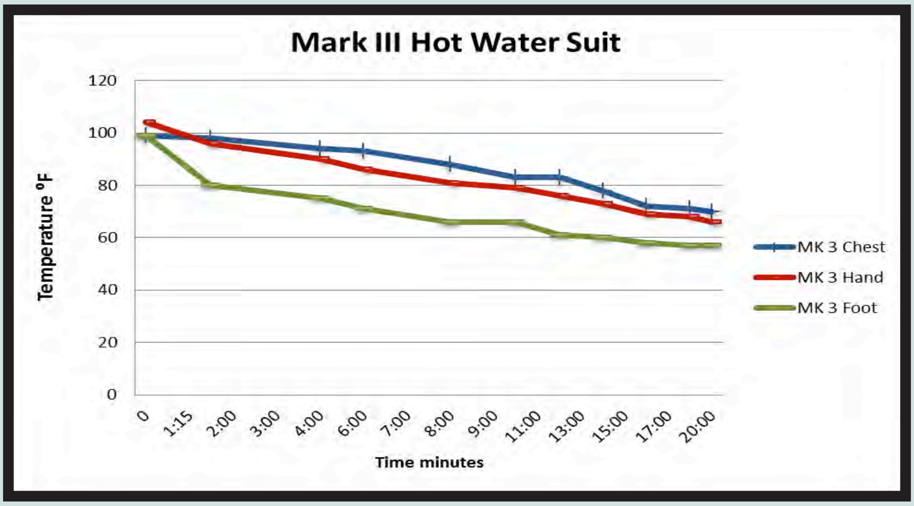
Recent events have shown that a diver has only a few crucial minutes if they get cut off from their hot water supply. The MK3 design significantly increases the amount of time for a diver to respond. The following diagram shows what happens to the diver's skin temperature if the hot water stops.




MK1


MK3


Mark I Hot Water Suit
Temperature ºF
120
110
100
90
80
70
60
50
40
30
20
10
0
0
1:15
2:00
3:00
4:00
6:00
7:00
8:00
9:00
11:00
13:00
15:00
17:00
20:00
Time minutes
MK 1 Chest
MK 1 Hand
MK 1 Foot


Mark III Hot Water Suit
Temperature ºF
120
100
80
60
40
20
0
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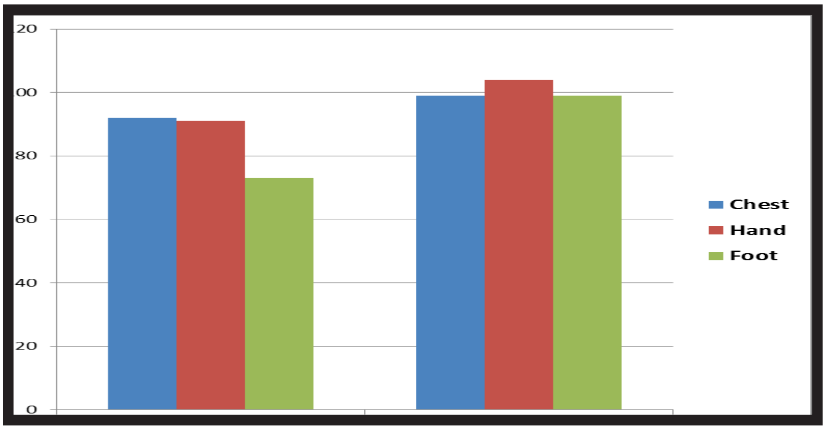
1:15
2:00
3:00
4:00
6:00
7:00
8:00
9:00
11:00
13:00
15:00
17:00
20:00
Time minutes
MK 3 Chest
MK 3 Hand
MK 3 Foot

	MARK 1	MARK 111
CHEST	92°f	99°f
HAND	91°f	104°f
FOOT	73°f	99°f

Comparison of Chest, Hands and Feet of MK1 and MK3



Performance

When a diver is warm, more accurate observations and better decisions are made and efficiency is increased. The MK3 substantially increases the diver's warmth in the hands – the hands are the diver's eyes in black water. A cold hand cannot feel detail. The diagram below shows the increased warmth of the diver's extremities.

Conclusions

- Using the current higher flow rates we can modify the technical approach to give a more even temperature distribution throughout the suit. (Water flowing from the extremities and exiting at a central point.)
- Having the socks and gloves sealed to the suit assist in better water circulation around the hands and feet, thus keeping them at a more effective operating temperature.
- Water exits at one point which is equipped with a one-way valve which can be sealed. This greatly reduces thermal shock if the water supply is lost and greatly increases the time for the diver to reach a place of safety.
- Higher hot water flow rates allow the use of a much thinner material that greatly increases the diver's range of motion, flexibility and reduces the encumbrance of the suit.
- Using a 300g/m2 fleece under the suit creates a much greater warm water layer between the diver and his suit than the 150g or lighter fleece; especially when under compression, such as bracing against something.
- A quickly replaceable glove system allows the diver to use a wide variety of gloves that meet the specific job requirements.
- The new boot system allows the diver to wear whatever best suits the needs of the job.

The Future

DUI has developed an electrically heated undergarment for use in dry suits. We believe this has great potential for use in the commercial diving industry. But that is the subject for another day.

DDRC PLYMOUTH TAKES ON A NEW IDENTITY

Divers Charity Launches New Identity

The Diving Diseases Research Centre, or DDRC, the charity which has run a hyperbaric facility in Plymouth since 1980, is entering a new phase in its development and to reflect this, is changing its name to DDRC Healthcare. This is to better express and represent its wider range of healthcare training, treatment and research activities.

Dr Gary Smerdon, CEO and Research Director at the charity, explains “We work to improve the understanding and use of hyperbaric oxygen (HBO) therapy. HBO is used to treat a wide range of conditions, not just divers with decompression illness. With our growth in provision of training and treatment services, alongside the research work, it felt as though our name no longer represented all our different activities.”

Keen diver and Medical Director, Dr Christine Cridge, added “Choosing a new name was not an easy process! Our charity is well respected, nationally and internationally, and we were keen to build on existing support, particularly from the diving community. We will continue to provide 24 hour emergency medical services, support, education and research to divers. The DDRC Healthcare name allows us to acknowledge and retain an element of our heritage, whilst becoming more widely relevant to our current breadth of patients and customers, attending for medicals, courses or wound care.”

Marketing and Fundraising Manager, Louise Walsh, said “marketing communications agency Real Fusion have helped us to create our new brand, visual identity and worked with us to build our fantastic new website at www.ddrc.org , which we have just launched”.

The charity also has two not-for-profit trading subsidiaries. DDRC Professional Services provides specialist training, consultancy and medicals, primarily to the diving, maritime, offshore and medical markets. Plymouth Wound Care provides private, high quality wound care services to the public.

Staff from DDRC Healthcare celebrated with an amazing cake creation made by Tracey Brown at Plymouth based ‘Funky Mamas’. Apparently, it was the first time that she had iced a hyperbaric chamber!

Photo Opportunity:

Photographs attached of celebration cake and new logo. Please contact us if you require any stock shots of our centre and activities or wish to take photographs here.

Contact Details:

Louise Walsh, Marketing & Fundraising Manager

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Address:
DDRC Healthcare, The Hyperbaric Medical Centre, Research Way, Tamar Science Park, Plymouth PL6 8BU

Website: www.ddrc.org

Twitter: @DDRCPlymouth

Facebook: /DDRCPlymouth

Notes:

• DDRC Healthcare is a medical treatment, training, and research charity, based at the Hyperbaric Medical Centre in Plymouth’s Tamar Science Park.

• The charity was established in 1980 as the Diving Diseases Research Centre and relocated to a purpose built facility in 1996 to become the first resident of Tamar Science Park.

• We provide a 24/7 on call service to treat emergencies including decompression illness (aka DCI or ‘the bends’), carbon monoxide poisoning, gas gangrene and necrotising fasciitis. Since January 2013 DDRC Healthcare takes all calls to the national British Hyperbaric Association (BHA) Diving Accident Helpline on 07831 151 523.

• Approximately one third of patients treated by us are divers with decompression illness (DCI aka ‘the bends’).

• The majority of patients receive routine hyperbaric oxygen (HBO) therapy for conditions including: non-healing diabetic foot ulcers (often potential amputations), tissue damage by radiation therapy for cancer, and non-healing wounds.

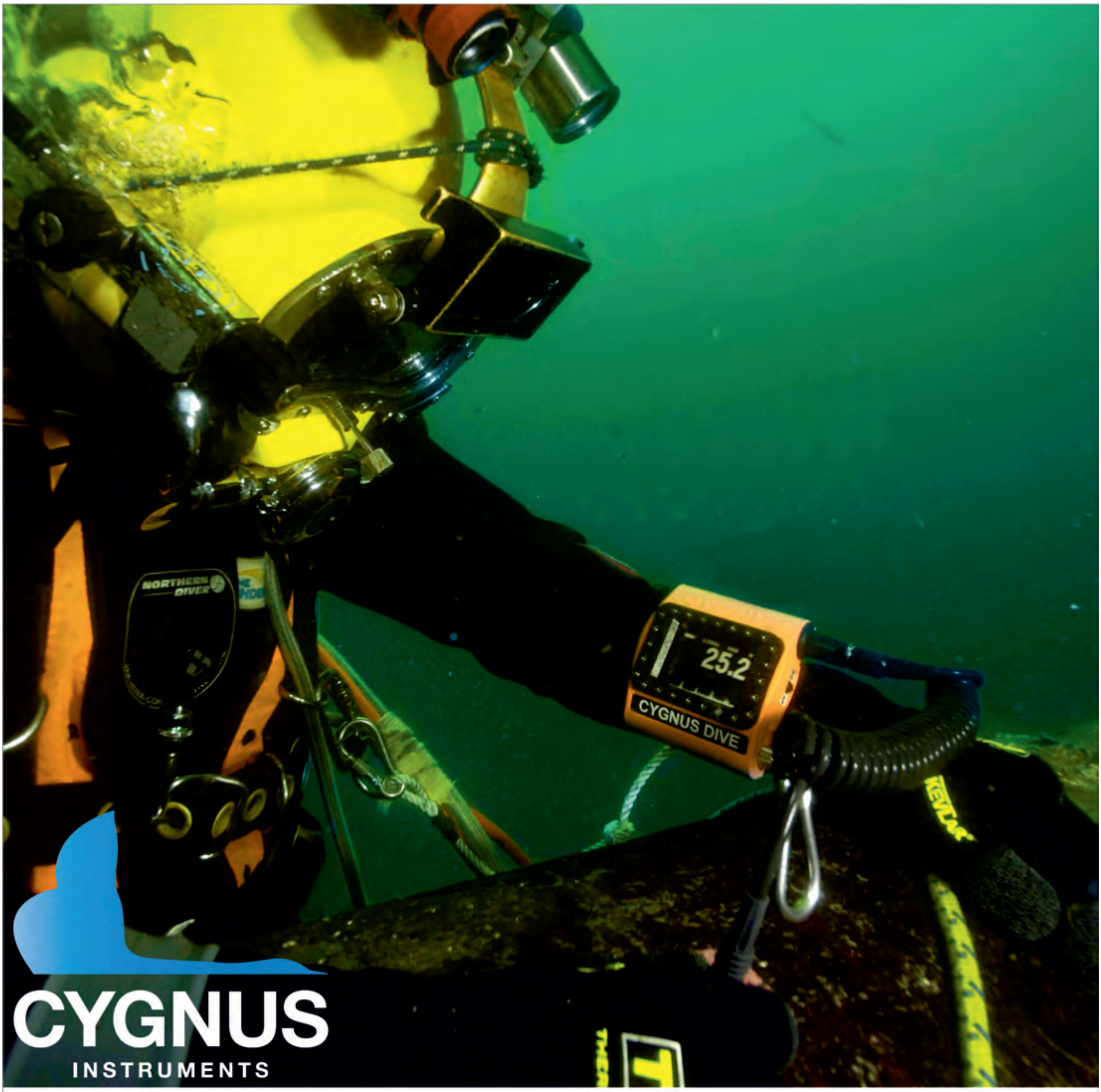
• The Hyperbaric Medical Centre contains a large multi-place hyperbaric chamber which can take 9 patients, 2 smaller multi-place chambers and 1 mono-place (single user) chamber.

• DDRC Healthcare is the only hyperbaric medical centre in the country which is also a registered charity (no.279652).

• DDRC Healthcare is a European Centre of Excellence for hyperbaric medicine and works on a number of international research activities exploring how hyperbaric oxygen (HBO) treatment works and it’s efficacy of various conditions.

• DDRC Healthcare has two trading subsidiaries: DDRC Professional Services and Plymouth Wound Care.

• The Senior Management Team consists of Chief Executive Officer Dr Gary Smerdon, Medical Director Dr Christine Cridge, and Operations Director Mr Peter Atkey.


NORTHERN DIVER
25.2
CYGNUS DIVE
CYGNUS
INSTRUMENTS

LIMITATIONS IN THE USE OF SCUBA EQUIPMENT IN OFFSHORE OPERATIONS (IMCA D 033 – OCTOBER 2003) AND THE ITALIAN SITUATION

by Manos Kouvakis – CEDIFOP Director

SCUBA – Acronym for Self Contained Underwater Breathing Apparatus, was developed in 1942 and, since that time, has been generally used by recreational divers.

Its main feature is the supply air from a compressed air tank on the back of the diver, as against surface supply diving, where the gas is supplied to the diver from the surface, through an umbilical.

In the past, SCUBA was also often used for commercial purposes, also on request of the clients. Now, after a huge number of accidents and casualties, the limitations of SCUBA, compared to Surface Supplied Diving, have become known.

In fact, the use of SCUBA in commercial diving is restricted to Inland/Inshore diving, and always with a safety/communication line to the surface, while “free” SCUBA – i.e. without a safety line - is used only in recreational diving.

In July 1994, IMCA in document AODC 065, stated: “SCUBA is a limited technique and it is strongly recommended to NOT use it in any offshore operation, oil and gas installation, construction, civil engineering or savage”. This concept was restated on April 1998, in the document “International Code of Practice for Offshore Diving (IMCA D 014 – Rif.2)” which stated: “SCUBA has many limits and difficulties, because of the limited supply of breathing gas. In no circumstances can the use of SCUBA, instead of a surface supplied system be a solution for safe diving. Moreover, it is stressed that the use of SCUBA is specifically forbidden for offshore operation by several National Regulations.

In some case, IMCA Members has been required by potential clients to use SCUBA, because it is thought to be an easy and cheap way to operate, but it should be remembered that it has many serious limitations: for example:

A Limited gas supply:

The time that diver can spend in the water is limited by the by the amount of gas he can carry. This is a problem for divers working underwater as their gas consumption is high

In many places of work there are obstacles underwater, which can catch diver. In these cases, SCUBA can represent a serious problem, whereas a diver using Surface Supply would not have a problem as he would have time either to solve it or wait for the Stand By diver, especially when in these emergency circumstances the divers gas consumption would increase.

Surface supplied divers carry a bail out tank and should the supply of air from the surface stop the diver has enough gas in his bail out to reach the surface. Whereas it has been proved statistically that almost all SCUBA reserve air supply systems have e record of failure in case of emergency.

Communication with the surface:

Divers in surface supply routinely have voice communication with the Supervisor on the surface, and increasingly, in addition, a video link. In the past SCUBA divers often had no communication with the surface, and again increasingly either a communication wire is attached to or combined with the lifeline or through water communications are used – bearing in mind their limitations of the latter – providing the safety of constant communication with the surface

The advantages of voice communication are:

- The Supervisor can talk to divers and control the work task to the best advantage.
- The Supervisor can monitor the divers breathing, and so give them immediate assistance in the case of an emergency.
- Divers can communicate with the surface in any kind of problem or difficulty.

Safety of breathing apparatus:

There are many variations of SCUBA. Some – particularly using a half mask in work situations - can cause serious problems in an emergency, for example, if a diver loses his regulator.

The use of “full face mask” or helmet, with an integrated regulator, can prevent this problem.

Decompression

It is normal for the Supervisor to have responsibility for the decompression profile of a working diver. This is difficult during SCUBA operations as he has no direct knowledge of the divers depth. Computers are often used by recreational divers but in working situations the Supervisor has not access to them, and so thay do not

relieve him of his responsibility. It is far safer to use Surface Supplied Equipment which provides the Supervisor with a direct readout of the diver's depth, and allows him to take direct control of the decompression procedure.

Mobility:

It is a common thought that Divers in SCUBA are more "free" that in Surface Supply. This could be true, but the risks are not acceptable, especially in open water during commercial diving operation. Moreover, in the case of an accident, the recovery operation of the Div er could be seriously compromised adverse currents. As an example, a fatal accident occurred in Livorno on the 24 February 2012, when a SCUBA Diver was carrying out the repair of a mooring in at a depth of 18 metres, when he was dragged to 50 metres depth and lost consciousness. Accidents like that often occurs because of inadequate training, when divers work underwater using recreational techniques.

It is really important to underline that ENI Spa, in a letter "HSE/SIC records office 16 dated 21 May 2008", is in force in Italy, with the title "HSE requirements for subcontractors of diving work", on page 9 it states "Self contained breathing apparatus (SCUBA) has many limits and intrinsic difficulties (the most efficient and safe method to work underwater is with surface supply diving equipment). Therefore, SCUBA equipment should never be used for commercial purposes connected with construction, repairing and maintenance".

Since 2010 Italian Offshore operations, have been run under the UNI Regulation 1136 and directives of IMCA and ENI.

Many fatal accidents have occurred because of inadequate, and the Member of Sicilian Parliament, Mr A. Di Biagio, emphasised this point in the Chamber of Deputies, at a Board meeting on 28 April 2011. During his speech, he pointed out the absence of an adequate regulation, concerning with the last accident, he said: "I assume every responsibility by affirming certain knowledge that the promulgation and application of those rules, should have save the life to that young man".

Since 1977, there have been 10 tries to define a regulation, during different legislatures (8 law proposal and 2 Unified Scripture in 2005 and 2009), but it has never worked.

For the above mentioned reasons, in these last years, many Port Authority tried to "manage" this problem, issuing local decrees, worried for the safety of Divers who working without adequate competence.

SCUBA, however, remains the best alternative for recreational diving in pairs, where the main goal is relaxation and fun and not work, which is restricted to qualified commercial divers, According to ISTAT (the nomenclature and classification of the Professional units In Italy) the qualification "diver", is listed under metalworkers' because it is in the category: Craftsmen, skilled workers and farmers, subcategory: Craftsmen and skilled metal workers and assimilated," under the heading "Divers and working divers" (there is no item for Sports Divers, as is sometimes suggested, wrongly, only for Water Sports). This classification is in full accordance with the European version of the International Classification of Occupations (ISCO-88Com) where divers are always in the category "Metal, machinery and related trades workers - Metal moulders, welders, sheet-metal workers, structural-metal preparers" under the heading of "Underwater workers".

THE ‘VIC’ INTERACTIVE VIDEO CONTROL SYSTEM

The VIC SYSTEM is a joint project developed by the “In-Out Security Service” in partnership with the Training Center “CEDIFOP” in Palermo. The prototype was made for underwater video in real time, to test the quality of filming in critical conditions of visibility and watertight in shallow water.

The project plan is to use of latest digital technologies combined with innovative concepts

During the IDSA/OTS course run in Palermo in 2013, with Students from different Regions of Italy as well as from Greece and the Republic of Cyprus, it was possible to film underwater in zero visibility, and obtain good results The main features of the system are the high resolution and the use of CCD with sophisticated controls which automatically correct the images in case of no light or too much light. The small size of camera and adjustable lights with LED, may readily adapted to all types of helmet. Moreover, both camera and video can be connected easily to umbilicals with a only 1 4 pin connector.

The system can also be adapted to fit ROV’s as the camera and light are made of stainless steel and can withstand high pressure.

The system will be described and shown in a presentation at the annual meeting, together with a video taken during the trial process.

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THE INTERNATIONAL DIVING SCHOOLS ASSOCIATION (IDSA) LIST OF MEMBERS

FULL MEMBERS: DIVER TRAINING

Centre de Formations pour Petites et Moyennes Enterprises (CFPME)	Belgium
Royal Danish Navy Diving School	Denmark
Luksia Sukellusala	Finland
YAK Diving Academy	India
Irish Navy Diving School	Ireland
CEDIFOP	Italy
Centre Méditerranéen de Plongée Professionnelle (CMPP)	Morocco
Netherlands Diving Centre (NDC)	Netherlands
Norwegian Commercial Diving School, Oslo (NYD)	Norway
Farjenas Diving School	Sweden
Swedish Armed Forces Diving and Naval Medicine Centre	Sweden
The Ocean Corporation	USA

FULL MEMBERS: SPECIALIST TRAINING

Interdive Services Ltd.	UK
KB Associates	Singapore

INDUSTRIAL MEMBERS

Palumbarus Diving Works	Italy
Alpe SUB Srl	Italy
Drafinsub S.R.L.	Italy
Hytech Netherlands	Netherlands
Pommec BV T.D.E.	Netherlands
Norwegian Association of Underwater Entrepreneurs (NBU)	Norway
Svensk Sjoentreprenad	Sweden

ASSOCIATE MEMBERS

Nautilus Dive Company	Austria
Aqua Prom Ltd	Bulgaria
University of Southern Denmark	Denmark
Arab Academy for Science, Technology and Maritime Transport (AASTMT)	Egypt
International Academy for Diving Technology (IADT)	Egypt
National Institute of Commercial Diving Universal Marine Institute (UMI)	Egypt
Faroe Dive	Faroe Islands
Groupe de Recherche Archeologique Sous Marine (GRASM)	France
Institut National de Plongee Professionnelle (INPP)	France
Diver Ltd	Hungary
Darya Koosh Marine Co	Iran
Irish Navy Diving School	Israel
In-Out Security Service	Ireland
Marine Consulting Srl	Italy
International Arab Divers Village	Jordan
IDEA Contracting	Kuwait
Regional Centre for Underwater Demolition (RCUD)	Montenegro
Mieka Dive Training Institute Ltd	Nigeria
Voronezh Diving school	Russia
Forespro	Spain
Oceanos Escuela de Buceo Professional SL	Spain
Arabian Marine Diving Centre	UAE
Diving Diseases Research Centre (DDRC)	UK
London Diving Chamber	UK
Divers Academy International	USA
Divers Institute of Technology (DIT)	USA
International Diving Institute	USA
Santa Barbara City College	USA

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Divesafe International	Canada
NAVFCO Military Diving School	France
Arena Sub Srl	Italy
NOS Nucleo Operatori Sommozzatore Societa Cooperativa	Italy
Eprons Ltd	Latvia
Nautiek	Netherlands
BPN Explorer	Poland
Voronezh Diving school	Russia
Podvoddiagnostika	Russia
Composite-Beat Engel	Switzerland
Aqua Mont Service	Serbia
Speciality Welds	UK
Underwater Centre	UK
University of Plymouth	UK
Searchwise Ltd	UK
Minnesota Commercial Diver Training Centre	USA

RECIPROCAL MEMBERS

Dutch Association of Commercial Divers (NVB)	Netherlands
Alliance of Russian Diving Schools	Russia
Association of Diving Contractors (ADC UK)	UK
Association of Commercial Diving Educators (ACDE)	USA
Association of Diving Contractors International (ADCI)	USA