INTERNATIONAL DIVING SCHOOLS ASSOCIATION

idsa

NEWS EDITION NUMBER 20 JULY 2012

IHC MERWEDE

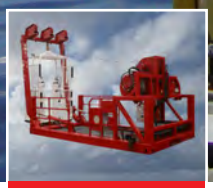
We keep you breathing

Deco Chambers

DDC - Decompression Chambers in portable and skid mounted versions

Helmets and Tools

All diving needs e.g. Helmets, Tools, Cables, Umbilicals, Lights, Diving Suits, Etc. etc.



Diving Systems

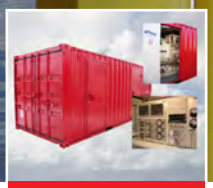
LARS - Launch And Recovery Systems for working depths till 100 meters

Diving Panels

Portable and Panel mounted Diving panels for 2-3 divers for working depths till 100 meters

Video and Comms

A wide range of Video and Communication equipment in portable and panel mounted versions



Containerized Systems

Containerized Systems including e.g. Decom-pression chamber, Dive controls, Gas supplies, etc. etc.

IHC Hytech B.V.

Elftweg 3
4941 VR Raamsdonksveer
The Netherlands

t +31 162 52 22 02
f +31 162 51 90 69
hytech@ihcmerwede.com
www.ihcmerwede.com

The technology innovator.

INTERNATIONAL DIVING SCHOOLS ASSOCIATION
idsa
NEWS

Edition 20 July 2012

FROM THE CHAIRMAN

I would first like to welcome our new Associate Members:

Aqua Prom Bulgaria
International Arab Divers Village Jordan
Voronezh Diving School Russia

The New Standards & Procedures
The revision of the Operational & Administrative Procedures continues, It is planned that the new Standards and Procedures will be split into Parts, which may stand alone or be combined as follows:

1. ***1. Details of the Association***
1. ***2.Training Administration***
1. ***3.The Diver Training Standards***
1. ***4.The Diver Training Code of Practice***
1. ***5.The Courses Guides***
2. ***6.Title not yet decided, but to consist of: definitions,the Table of Equivalence, Standard Programmes, and others not yet decided.***

All members will have received Part 1 in March and Part 2 mid July.

Part 3 - The Diver Training Standards, will be distributed later; the Standards have not changed since it was agreed at the last meeting in Karlskrona that the use of helmet mounted cameras, and practical wet welding training would be included.

Part 4 is new and will contain guidelines for diver training operations, and Part 5 is guidance to members who are thinking of setting up Specialist Diving Related Courses.

Finally Part 6 is intended to contain information which is common to more than one part, in order to save repetition.

It is planned that Part 4 will be circulated in early August for comment

All Parts will then be E mailed to all members before the meeting and those attending the Seattle meeting will be asked to print and bring them along.

Termination of Membership

It is with regret that I have to report that the School in north west Italy which was suspended in March 2011 did not change its training programmes to meet IDSA standards, and its Membership has been terminated.

The Auditing Programme for Full Members

At the Karlskrona meeting it was agreed that all Full Member Schools would be audited every 5 years. The programme will be arranged as follows:

2012 NYD, Oslo April18–20 *(completed)*
Royal Danish Navy Diving School October 23/24
Luksia Sukellusala,Finland
(To be arranged)
2013 NDC Holland - Swedish Armed Forces - Farjenas Sweden
2014 CEDIFOP, The Ocean Corporation
2015 The Divers Academy
2016 CMPP, Morrocco
2017 NYD Oslo, etc

LEO LAGARDE

Editors: Alan Bax
and Jill Williams
Art Editor:
Michael Norriss

International Diving
Schools Association
47 Faubourg de la
Madeleine
56140 MALESTROIT
FRANCE
Phone:
+33 (0)2 9773 7261
e-mail:
info@idsaworldwide.org
web:
www.idsaworl dwide.org

ABOUT IDSA

The Association is concerned with all divers - Offshore, Inshore and Inland, and has established International Diver Training Standards based on the consensus view of its many members. The Standards provide both a yardstick for those responsible for either administering existing National Standards or creating new ones, and a guide for Clients, Diving Contractors and Divers themselves. It is considered that the introduction of these Internationally agreed diver training standards will have the effect of improving safety, providing contractors with a direct input to the Diver Training Syllabus enabling Contractors to bid across national borders on a more even playing field, improving Diver competence and providing Divers with greater job opportunities.

Some governments have and will, set their own National diver training requirements. The IDSA programme provides a means of equating National Standards by maintaining a Table of Equivalence.

One of the main thrusts is towards International Diver Certification in order to bring together the various National Schemes which are currently in existence. However, the Association is not just concerned with standards; it also serves as a valuable forum for the interchange of News & Views between members, many of whom are the only Commercial School in their Country. Current routes for this interchange are the Newsletter - published in January and July, the IDSA Website: (www.idsaworlwide.org) the Annual meeting in September/October, and various and many forms of contact between members and the Executive Board.

For Membership and all other information contact the Administrator at: info@idsaworldwide.org

Accommodation
The Conference Hotel is:
The Holiday Inn Seattle
211 Dexter Avenue North
Seattle
Washington 98109

ANNUAL MEETING 2012

SEATTLE
29th TO 31st
AUGUST

Hosted by
the Divers Institute of
Technology (DIT)

ABOUT THE MEETING

A special rate of $160 (including tax) per night – double or single room occupancy - has been arranged. Bookings should be made direct with the Hotel quoting 'IDSA Meeting August' by telephone (+1 206 728 8123), or via the Hotel Website www.holidayinn.com/seattle - Group Code DIA. In case of any 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 fee which will cover attendance, all transport, refreshments, lunches, and the Association dinner is €350 per delegate and €400 for observers

Travel

By Air : The journey time by taxi from Seattle Tacoma International Airport (SEA) to the Holiday Inn is 20 minutes, and the fare about $45

By Rail or Road : See the Hotel Website www.holidayinn.com/seattlewa

Information

Full details are available on the IDSA Website where changes and additional information will be shown

The Agenda

The Agenda for the meeting sessions will be circulated in August.

OUTLINE PROGRAMME

TUESDAY 28 August

1830 to 2030	Registration and welcome drinks in the Conference Hotel, Holiday Inn, Dexter Avenue

WEDNESDAY 29 August

0930	Welcome by Phil Newsum Executive Director, the Association of Diving Contractors International (ADCI)
0945	Meeting session 1
1230	Group Photograph
1245	Lunch at the Hotel
1400	Tour of DIT
1630	Meeting Session 2
1730	Cruise round Lake Union in the Schools D.V 'Response' with a 'Finger Buffet' on Board
1930	Return to Conference Hotel

THURSDAY 30 August

0930	Meeting Session 3
1230	Lunch at the Hotel
1400	Presentations
1500 to 1730	Tour of Global Diving & Salvage Facility hosted by Tim Beaver, Chief Executive Officer
1900	Aperitifs at either the Conference Hotel or the Harbourside Restaurant
1930 to 2200	Association Dinner at the Harbourside Restaurant

FRIDAY 31 August

0930	Meeting Session 4
1200	Meeting Closes
1300	Bus from Conference Centre to the Airport

Notes:

1.The outline programme above is subject to such changes as are necessary for the smooth running of the programme.

2. The Agenda for the meeting sessions will be circulated in August

HENRI DELAUZE

We would like to pay our most sincere respects to a legend of the diving industry who died earlier this year on February 14 . His exceptional and pioneering example, has contributed immeasurably to the future of the Diving industry:

Henri DeLauze founded COMEX and its world-renowned Subsea Services in 1961. He was awarded a degree in engineering from the Ecole Superieure des Arts et Metiers in Aix-en-Provence (1946/49) and a Master of Science in Marine Geology at the University of California (Berkeley) in 1960. From 1952 to 1955, he cooperated on a voluntary basis with Captain Cousteau's team as an engineer and as a diver in Marseilles (OFRS). From 1956 to 1961, during his promising career with the big international contractor, Grands Travaux de Marseille, he was responsible for several major large construction sites, including the motorway tunnel under Havana baB in Cuba (1956/57),

At the end of 1961, back in France, he joined the CNRS (National Centre for Scientific Research) as head of the "ARCHIMEDE" Bathyscaph Submersible Laboratory in which he carried out a dive to a depth of - 9,650 metres, off the coast of Japan in 1961. He thus became the "Deepest Frenchman in the world" (the deepest human dive was sponsored by the US Navy with Ct Don WALSH and Jacques PICCARD in the Batyscaph "TRIESTE" to 10.700 m. in 1960). Delauze anticipated the oil industry need for deep diving assistance and created a hyperbaric experimental center where scientists and engineers could study the effects of pressure on divers and develop new sub-sea techniques.

He personally participated in the first dives with helium at depths of 335m and 360m during which the high-pressure nervous syndrome was discovered and described. Under his leadership COMEX developed many of the technologies now used by all the offshore industry such as the diving spread configurations, hyperbaric welding, cold and hot tapping, abrasive jetting and underwater NDT. Henri has been married since 1953 and has three children, Michele, Marc and Beatrice

IDSA visits Oceanos in Barcelona

Dag Wroldsen, the Secretary of IDSA while attending a meeting of Norwegian diving contractors was able to visit Associate Member School 'Oceanos' in Barcelona. Dag was given an overview of the School and its current activities, and was able to discussed the plans for Oceanos to become Full members.

Left to right: Mr. Javier Ferrán (Director of OCEANOS), Mr. Felipe Llorente and Mr. Armin Sidali (OCEANOS), Mr. Dag Wroldsen (IDSA), and Mr. Agustí Ruiz (IEM)

Like Father, like son/daughter

.... or so they say. This photo shows Charles Albier 14 years, son of the Training Director of INPP Marseilles, and Ingrid Wroldsen also 14 years daughter of the owner of the Norwegian Commercial School (NYD) near Oslo tending divers at NYD.

They both spent a week at NYD with the purpose of giving them realistic work experience. Both took the job very seriously and in addition to tending they did maintanance on equipment and boats etc - Ingrid also used this oportunity to improve her French skills and Charles his English....!

HSE Recognition of non-EU diving qualifications.

As a result of recent discussions with the International Diving Regulators Forum and other interested parties, HSE had decided to discontinue the automatic recognition of diving qualifications from non-European countries.

The implementation date has not been set, but would not be before the 1st April 2012. From the implementation date any diver who holds qualifications fro m non-EU countries and who wishes to dive at work in the UK will need to apply in writing (including email) to HSE for approval of their qualifications. This arrangement will not be retrospective. As a result the List of Approved Qualifications issued by HSE, and available on their website, will remain for non-EU qualifications obtained before the implementation date. The parameters for competence will be transparent and available on HSE's website.

However, the ultimate responsibility for ensuring competence remains with the company that employs the diver, in accordance with requirements of the Diving at Work Regulations (DWR) 97 Reg 6 (3) (a).

Board members relax during a break in the April meeting at NYD, Oslo. Left to right: Dag Wroldsen (Director of NYD), Oxana Kruglova & Sergei Cherkashin (Russia), Ashild Eftvag (NYD), Leo Lagarde (IDSA Chairman) & Lene Fevang (NYD)

The Administrator (right) discussing possible ways of promoting the IDSA programme within the European Union with the Political Adviser to the MEP for East England, Stuart Gulleford.

The Qualification Card programme

The computer programme has been completely updated and streamlined. It will no longer be necessary to type details twice (once in the database and once in the Card programme) as they will now be combined. The new cards will show the new Logo, and the signature on the reverse will be printed – not written – so that it cannot be erased.

Board meetings

The Board is now making full use of 'Skype' for Video meetings which took place on23 January, 14 & 22 March, 19 April & 21 June. The April meeting at NYD was interesting in that two members joined it by 'SKYPE' and two visitors from the Alliance of Russian Diving Schools (a Reciprocal Member) attended as Observers.

The main topics of discussion were:

- Liaison with EDTC:IDSA will be giving a presentation at its next annual meeting in October
- The possibility of obtaining ISO or DNV recognition
- The Seattle Programme and Agenda
- The revision of the Standards and procedures – in particular the content of Part 4, the Diver Training Code of Practice.

PCN UNDERWATER INSPECTION SCHEME –THE STORY SO FAR

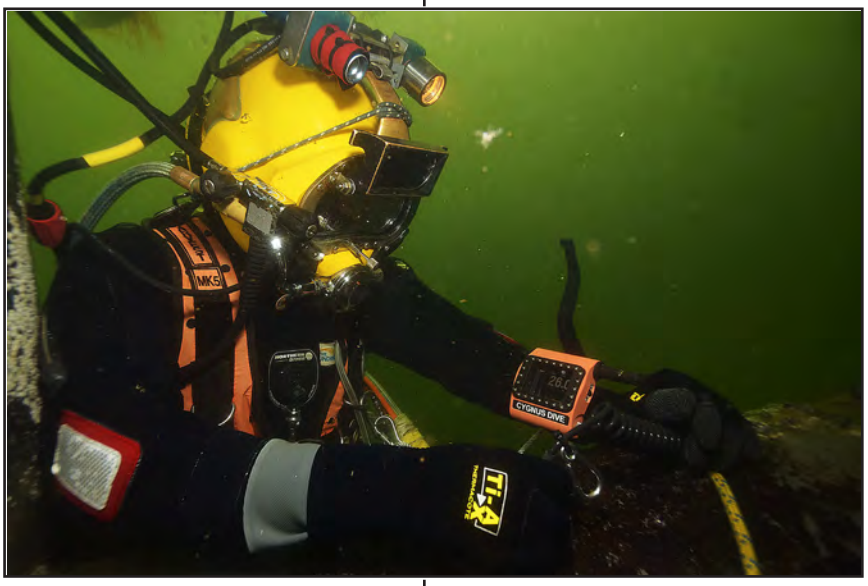
Steven Grindrod, Working Group Chairman
PCN Underwater Inspection Scheme

We have previously written about a proposed new underwater inspection scheme being delivered under the auspices of BINDT. This is making good progress and the story so far is……..

The BINDT Certification Management Committee and Council approved the scheme earlier this year The Level 1 course notes are complete and are awaiting validation. Much of the content is applicable to the other levels of qualification but additional course notes will be produced as required Final edits are being made to the marking guides and examination questions have been drafted Prospective Authorised Qualifying Bodies (AQBs) have been identified

A date and venue for the pilot scheme will be decided as soon as one or more of the prospective AQBs and Approved Training Organisations (ATOs) has been successfully audited and appointed So the PCN Underwater Inspection Scheme has now moved off the drawing board, it now exists but perhaps some clarification concerning what the new scheme is about may be useful

The PCN scheme is discipline specific so it was important to design the underwater scheme to fit in with that basic philosophy, to that end Underwater Inspection has been considered as a single discipline So have we made a round peg fit into a square hole? Well no, we haven't. What we have done is consider the reality of the situation.



When a client wants an underwater inspection carrying out they expect a single dive team or team member to be capable of completing whatever inspection tasks are required. This also simplifies the decisions a company has to make concerning manning requirements Underwater inspection and those who practice it are in a unique position compared to their topside colleagues. Due to the nature of diving and ROV work personnel involved must be multi-skilled; it is not convenient or sometimes even possible or indeed financially viable to change out a diver or pilot whenever a different type of inspection is required. They therefore require a certification scheme which is similarly multi faceted.

Therefore the PCN Underwater Inspection Scheme is designed as follows:

In common with other PCN schemes it will have three levels but the first two levels have been separated into Diving and ROV. There will be a Level 1 Diving qualification and a Level 1 ROV qualification (eventually!!). There will also be Level 2 qualifications for each discipline

The Level 1 qualification will cover all the practical aspects of the discipline, actually getting down and doing the job. They will know how to follow a specified procedure and why it is important to do so but they will not be expected to design, develop, write or administer that procedure; they will know how to do the job

They will be trained and examined in the practical aspects of all current underwater inspection tasks commonly carried out around the world, inshore and offshore

The Level 2 qualification is intended to be supervisory and will cover the procedural and control aspects of underwater inspection. They will ensure that the correct methods are being applied and to the proper standards. In common with other PCN qualifications Level 2 people will have a proven practical background in all the skills they are expected to supervise and control

Having the diving and ROV disciplines separated in this way will address the needs of those companies who specialise is either but rarely if ever both. It is common for ROV companies for instance to need inspection controllers, but currently there isn't a suitable qualification available which doesn't include a large section devoted to diving. The Level 2 ROV Inspection Controller qualification will cover all that is required of such a person without the need for candidates to study and be examined on subjects they neither need nor want.

The same goes for the Level 2 Diver Inspection Controller qualification; that will be diving specific and

contain little if any ROV inspection content except for possible reference or comparison purposes
The Level 3 qualification will cover both diving and ROV inspection and this person will be conversant with all methods of underwater inspection as carried out by divers and ROVs. They will be experienced in the practical aspects and the procedures involved in both methods of inspection data collection. Additionally they will be proficient in the various methods used to, gather, record and process inspection data.

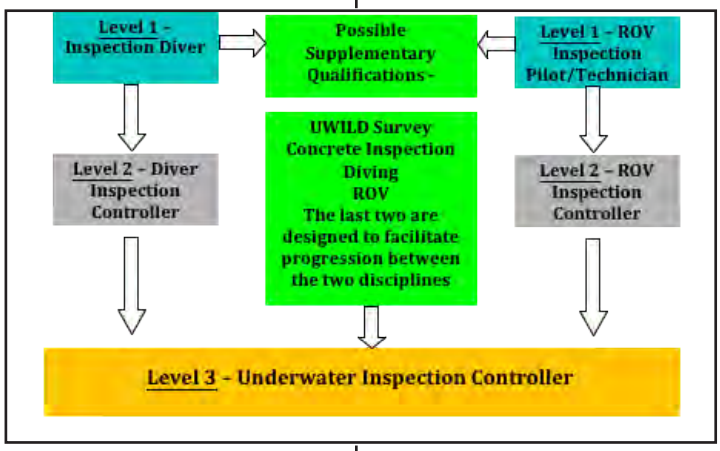
They will also be familiar with the considerations relevant to multi-role work scheduling when divers, air and saturation, and ROV simultaneous operations are required

The flow chart below illustrates the relationship between the different levels of certification planned
The flowchart shows the possible supplementary qualifications which may be developed. Some working group members have enquired about the possibility of having a UWILD (Underwater Inspection in Lieu of Dry Docking) qualification for those people and companies who specialise in such work.

Others have asked for a concrete inspection supplement to be considered. The PCN supplementary qualification system lends itself very well to such additional applications

The diving and ROV supplements would enable those people who have previously qualified to Level 2 in either diving or ROV to attain the Level 3 qualification
Cross-over provision from existing underwater inspection certification has been discussed and the requirements for this have been included in the scheme documentation
The possibility of integration with topside NDT qualifications has also be intimated and may be discussed further in the future

It is intended that the scheme should benefit from centralised documentation. All training organisations, no matter where they are, will use the same course manuals, datasheets, classroom worksheets etc. The documentation will be controlled, reviewed and modified as required by PCN Administration and the scheme working group Reviews and any modifications are expected to take place annually. This will be subject to practical considerations but having standardised documentation centrally controlled should make this process more manageable



The scheme will initially be in the English language but there is recognition of the need for foreign language versions and these will hopefully be developed as the scheme is taken up

Anyone interested in obtaining further information about the PCN Underwater Inspection Scheme can do so by contacting suzanne.purdy@bindt.org (PCN Administrator)

Jill Williams was the Director of the Health Education Unit at King's College, University of London, for ten years, developing courses which met both high academic and professional standards, before moving to Fort Bovisand Underwater Centre where she was Admin Manager until its sale to new owners in 1996. She was the External Evaluator for the HSE in its development of the Central Examination System. She has a strong interest in Diver Training and Safety and has been associated with IDSA since 1990 since which time she has attended almost all Annual Meetings firstly as an observer and then as Minutes Secretary. She also acts as secretary to the Executive Board, and is joint editor of IDSA News.

PLANNING FOR THE FUTURE OF DIVER TRAINING –SOME PERSONAL THOUGHTS

The views expressed here are the personal reflections of the author after close contact with the association over a number of years. They do not claim to reflect those of IDSA members and officers

It has taken IDSA over twenty years of discussion, argument, negotiation, and sheer hard work to arrive at the present situation in diver training where there is a well thought out programme for training professional divers for the world of work. So I don't suppose I am alone in feeling frustrated by the frequent announcements from various bodies that they are intending to produce yet another new plan for diver training. Such bodies often behave as if they are the only people capable of developing such programmes, and they seem ignorant of any work which has already been done; at its 'best' such an attitude results in time wasting, whilst at its worst it betrays an arrogance which, in my view, is quite unjustifiable.

However, in our constant search for high quality diver training it is important that we regularly review our own procedures and try to avoid the weaknesses which we see in others. In this and the following issue of IDSA News I want to look at how we can - in co-operate with others who have a legitimate interest -try to ensure that the training of divers throughout the world is of the highest quality and as safe as we can make it.

It seems to me that there are a number of individuals and groups who do have a legitimate and logical interest in the training of divers. The views of clients, contractors, and other employers of divers are clearly crucial here – divers exist to work so those who employ them must be clear about what skills and qualities are needed. Once these are established then it is up to a number of other groups to make their contribution. For example, doctors need to ensure that work demands are within the physiological and mental capabilities of the human being, and that working practices do not put divers under unreasonable or even dangerous stress; schools need to be consulted as to what can – or cannot – be taught outside the working environment, about how experiences can be sequenced to develop knowledge in an efficient way, and how students can be assessed fairly to ensure high quality entrants to the profession. Health and safety experts have a contribution to make, as do unions if divers are to be treated fairly and have adequate recompense for their work. All these, and probably others, have a contribution to make to the planning and carrying out of training for divers.

So here we already find the first problem, for the above requires that these groups meet together and talk to each other. As an 'outsider' I have been struck by the way in which there is very little communication within the diving fraternity – it often appears that each group believes that it knows best and is not prepared to talk – or listen – to anyone else. One consequence of this is that a great deal of time is wasted while groups 'reinvent the wheel', taking little or no account of what has already been done, nor of how things have changed. A classic example of this is the way in which various diving interests refer to the 'HSE Regulations'. On further examination it becomes clear that these groups are working with concepts from the 1980s and appear to have no knowledge of developments and how the remit of the HSE has changed since that time.

Equally problematic for the future of the industry as a whole is the way in which 'specialist' interests put

Jill Williams in discussion with Bruce Banks–Divers Institute of Technology – during the Annual meeting in Rotterdam

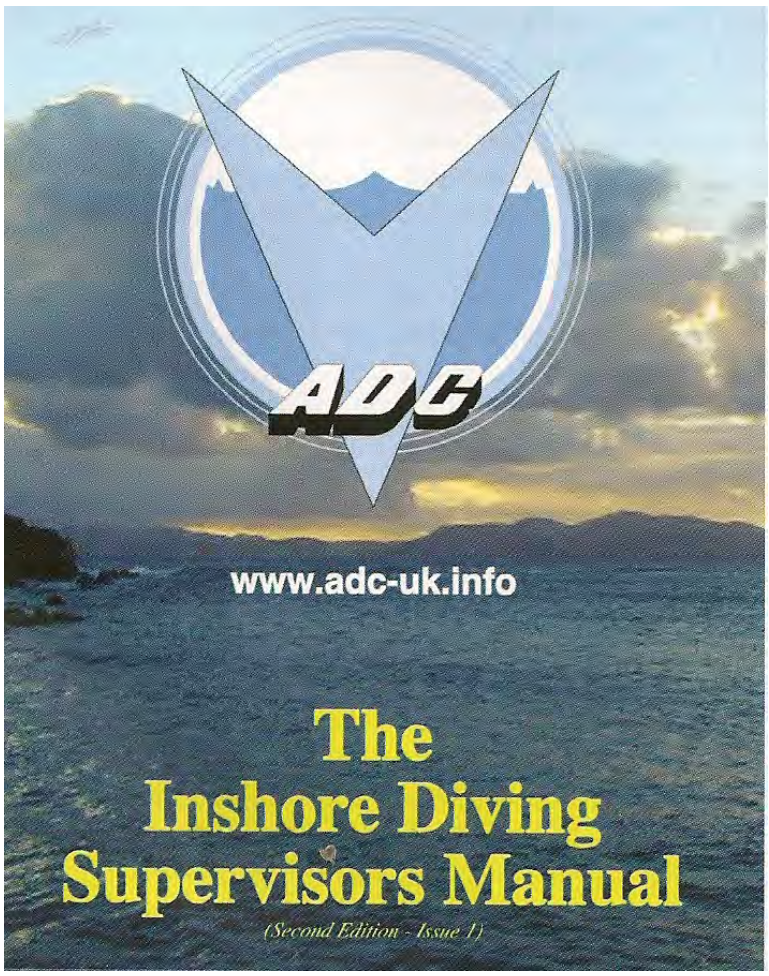
themselves forward as the experts when they are nothing of the sort. It makes sense before accepting these pressure groups at their own valuation that those concerned with the future of the diving industry look very carefully at the vested interests which lie behind such claims; sometimes the influences are political, trying to exert power over others, often they are simply ways of making money. Frequently such groups claim to be representative but examination of their membership shows them to have clear biases in their composition. In the past there have been examples of Diver Training committees with no representation from training; equally, with the present tendency of unions to amalgamate into ever larger units, a numerically small group such as divers necessarily becomes less visible and less important in the overall picture. In my view, to think in terms of 'experts' is just plain wrong; what we have is a large number of individuals and groups who have expertise to contribute, and their views should be taken into account in any planning – inclusion rather than exclusion should be the byword.

Over the years, IDSA has recognised this and has invited representatives of such groups to meetings. For example, IMCA, ADCI, HSE and others have been represented at a number of meetings and invited to put forward views and join in discussions, and have, indeed, done so. But large organisations such as these often find it difficult to negotiate for change and it is often the case that a flat statement of their position, without room for negotiation, is all that is available. Equally disappointing is the way in which 'talking to each other' ignores the need to 'listen to each other'. In the UK the need to understand another point of view is made even more difficult by the position of the HSE (Health and Safety Executive) which is expressly limited to talking only at government level by its statute. It is thus unable to engage in formal talks with the International Diving Schools Association because IDSA is not under the control of a single government – if ever there was a regulation limiting progress this is surely it!

So the first requirement of planning for future diver training must, logically, be consultation with others who have a legitimate interest in such planning. This should give a clear indication of the expected outcomes of training, i.e. what levels of knowledge and skills an employer can reasonably expect from a 'Qualified Diver' regardless of whether they have been achieved as a result a training course, apprenticeship, or whatever. (A good example of how this should be done is the way in which the IDSA courses were planned.) In recent years there has been a fashion for these achievements to be labelled as 'Competencies' but in practice they are simply another way of expressing what courses used to call 'Aims and Objectives' . 'Competencies' is a useful term since it clearly indicates what a successful student or applicant should be able to do, rather than focus on what a school should intend its students to achieve (Aims and Objectives). In practice the difference is semantic but Competencies became the 'politically correct' form in the 1980s when it became attached to the notion of open access to courses and work. It is a particularly useful concept where alternative ways of gaining access to traditional courses is desired – for example in the UK some courses in teacher training took into account 'life experiences' (bringing up children for example) rather than the achievement of academic qualifications when selecting students. In diving it has been argued that so long as a diver can perform certain tasks (competencies) it does not matter how they have been acquired.

The difficulty in diving may be that in many countries the acquisition of such competencies may not be legal outside the safe environment of a school. In theory, though, if the competencies and their assessments are clearly set out, there is no reason why this method should not be used; indeed, schools make such assessments of their students all the time! Clearly this is an area which would benefit from further discussion and the claimed intention of EDTC to update its 2002 list of competencies for Diver Training would seem to provide an excellent opportunity to do this, especially if it can be assured that the group undertaking such work is inclusive of all those with a legitimate interest, rather than the somewhat exclusive group which produced the original document.

In this article I have tried to show that future refinements in Diver Training depend crucially on setting out clearly what a competent diver should know and be able to do and that these decisions should be the result of wide consultation both inside and outside the industry. In my next article I should like to look at how IDSA members have contributed to the debate and how assessment of students and the auditing of schools might develop in the future.



DRYSUIT MAINTENANCE Chris Gabel

This months topic of discussion is drysuits. I'd like to take a moment to touch on some history, some differences, and then deal with maintenance and light field repair.

To address the history of the drysuit, we have to start with the development of the diving helmet. The first of these was the "smoke helmet" which was invented by Charles and John Deane in England in or around 1824. Two challenges that the brothers faced were that when the diver leaned forward, the "smoke helmet" would flood. The other was to allow air to exhaust out of the helmet. A short jacket was attached to the helmet and air was allowed to exhaust from the bottom of the garment. This also helped resolve the flooding problem as. Therefore, the first diver's dress was born. The helmet was modified around 1834 by Augustus Seibe at the behest of the brothers Deane to turn it in to an underwater diving helmet. It was George Edwards, however, that really invented the first full divers dress, about 1838. It's Edwards that we should credit or blame for the invention of the first drysuit. Since then we've been inundated with many different designs both in pattern and material. There are some differing versions of the story. This is just a very brief synopsis of the history, for more information, I would suggest visiting or contacting the Historical Diving Society

Figure 2The author 'Standing By'

Figure 1

at www.hds.org or similar organization.

Let's go through some of the different types of drysuits on the market today. They all have their assets and liabilities. There is no such thing as the perfect drysuit. Everything is a trade.

Of the several different drysuits on the market today, some of the most popular are the tri-laminate (Figure 1), butyl rubber, crushed neoprene, and the vulcanized rubber drysuits (Figure 2). For the purposes of this discussion, we'll only be referencing these types of suits. The tri-laminate is a sort of re-invention of the original divers dress of sorts. It uses modern, most if not all, synthetic materials to create a thin waterproof barrier. They are highly flexible but provide very little thermal protection. They are also not as chemically resistant as other drysuits. In contrast, the butyl rubber drysuit is highly chemically resistant very resilient suit. That said, like the tri-laminate suit, it provides little in the way of native thermal protection. It's also the least flexible of the suits we're discussing here.

Next on the list is the crushed neoprene drysuit. This is a very popular suit that gives a diver superior native thermal protection and is very malleable. The downside is that, like the tri-laminate, it's not very chemically resistant and is not usually field serviceable. Finally, on our list, we have the vulcanized rubber suit. This is a tough suit that has become very popular in the commercial, military, and public safety communities. Although it provides little thermal protection natively, it is only below butyl rubber for it's chemical resistant protection properties. The vulcanized rubber drysuits are also more flexible than the butyl rubber suits. They are also field serviceable.

One question that I am faced with is seal preference. Two of the most common are latex and crushed neoprene. I know, I know, you also have vulcanized rubber for the neck dams that can be installed to mate with dive helmets. In that case, you don't have a choice and a latex neck seal is commonly used underneath the neck dam. You're

also talking about an environmentally sealed system which changes some of the rules. In that case, you're also diving dry gloves that, by definition, separates the wrist seals from the surrounding water. So back to the question of latex or neoprene. That's a question that the diver himself (or herself) has to answer. A neoprene seal usually lasts longer and is not as prone to accidental damage as latex is. Latex, however, is more easily replaceable as well as being more flexible. The choice comes down to preference and mission.

One important point that I would like to shed some light on at this point of the article is referencing some important material concerning diving in contaminated water in relation to drysuits. There's some great literature that covers this very subject that I would like to present to you, the reader. An excellent guide to diving in contaminated water can be obtained from Trelleborg Viking, Inc. The booklet is entitled appropriately enough "Diving in Contaminated Water". The book can be ordered directly from Trelleborg or from Hammerhead Press' online store. Another valuable resource is the chart of chemical permeation test results provided again by Trelleborg Viking and can be found on the internet at www.trelleborg.com/protective/images/Dcw_tests.pdf. This report focuses on how chemicals react to the different suits that Trelleborg Viking, Inc. produces. It also gives you a baseline to compare other suits to as far as their length of service in different conditions. It's certainly not a comprehensive list of all hazardous materials that can be found in a marine environment, but it gives you a place to start.

Let's go over some basic drysuit maintenance. One thing that all have in common is that any drysuit needs to be maintained and checked thoroughly before and after every dive. Basic maintenance requires rinsing the suit in fresh water and allowing it to dry fully before stowage. Keep all of the suits, no matter which material and design you chose, out of direct sunlight whenever possible. Every manual states that you need to make that a priority, but we all know that's not always possible. Direct sunlight will break down the materials and lessen their operational lifespan. Visibly checking for rips and tears in the materials is also essential. Not thoroughly checking for cracks, punctures and material gaps can be range from being uncomfortable due to cold water intake to being a deadly scenario if diving with hazardous materials.

One thing to pay particular attention to is dry rot. This is very common in older latex neck and wrist seals, micro cracking will be the first sign; this will later lead to breaches in the material. Direct sunlight and chemical exposure will have a direct effect on the length of time to failure. For other suit breaches that seem to defy explanation, there are a couple of field methods to find the leak. This is not a comprehensive list by any means but a quick and dirty way of finding out why you're getting wet. The first is to don the suit and jump into clear non-fouled water. Pressurize the suit and ask someone on deck or in the water to look for bubbles. If that method isn't possible, then don and pressurize the suit. Fill a spray bottle (if one is available) or bucket with soapy water.

Coat the suit with the soapy water solution and again look for bubbles to identify the source of the leak. Depending on the kind of suit you're using will depend on the resolution of the leak. My first suggestion is to use field replaceable seals. These are available from several of the drysuit manufacturers. For instance, DUI offers their version of these in a product called ZipSeals. They work a lot like a freezer bag you get at a grocery store. Another version is offered by Trelleborg Viking, Inc. These ring seals consist of three parts. You have a rubber outer ring, a plastic inner ring, and the wrist seal itself. One convenience is that they don't use any proprietary part for the wrist seal. It simply sandwiches the wrist seal in between the inner and outer rings. You should be able to change a complete set in less than 5 minutes. They also make a similar setup for the neck seal. Depending on your application, these work well to becoming a bit cumbersome. There is one added bonus with the Viking ring system, their dry gloves fit over top with no additional modification. This means that you can dive with or without a dry glove system without having to change any other additional parts.

For minor field repairs, many of the drysuit manufacturers include a field repair patch kit. This will take care of minor breaches in the skin of the suit but not usually the latex pieces. Those are going to require replacement. Some neoprene seals can be field patched, but that is going to depend on the kind of damage and its location. Any repair is going to dictate that you start with a clean, dry surface. Follow the instructions provided by your suit manufacturer for minor repairs. If you don't feel comfortable making those repairs or the suit requires more time and attention than you have at the time, send it to a factory trained professional repair facility. Sending it to a properly trained repair facility is paramount if you're diving is hazardous conditions. Better to be confident that the fouled water doesn't make contact with the diver than potentially have the spend quality time in a hospital or worse.

A good quality drysuit will serve you for years if taken care of properly. It's like any other piece of equipment, the better you take care of it, the longer it's going to serve you. Don't hesitate to contact any repair facility, retailer, or manufacturer should you have any question. Safety is the rule here. Dive safe.

Email questions for Chris Gabel to Cgabel@OceanEyeInc.com

MIEKA DIVE TRAINING INSTITUTE

Thompson Ogegbene

MDTI believes that to make it to the Top - dig Deep.

The Mieka Dive Training Institute Ltd/ Gte (MDTI) is a Nigerian commercial diver training school registered in 2011 with registration number RC945493 from the Corporate Affairs Commission.
MDTI is the first commercial diver training school in Nigeria to be an associate member of the International Diving Schools Association in August, 2011. The Institute is being managed by competent management team of administrative staff and dive instructors.

MDTI is established to meet the needs of individuals who are interested in becoming successful professional divers. Owing to the importance of standard training facilities and instructors in the training of commercial divers, MDTI has put in place in its training centre the necessary standard training facilities and qualified dive instructors in order to provide quality training on scuba air diving 30m, inshore surface supply air diving 30m and offshore surface supply air diving 50m.

MDTI's mission is to provide the commercial diving industry with entry level and post graduate personnel who excel in knowledge and skills, safety and work ethics. The training is comprehensive, rigorous, and designed with, individual student's career objectives, abilities and interests in mind.

We train our students in all aspects of diving to the highest standards available. The Institute prepares graduates for employment in commercial diving and related industries and for them to be able to perform with minimal supervision.

MDTI is aspiring to be among the most modern diver training schools in the world with a unique link to the diving industry through its sister company Mieka Dive Ltd, one of Nigeria's largest diving and underwater engineering contractors. In addition, through its mother company Fenog Nigeria Ltd, MDTI purchased all necessary diving and underwater engineering equipment from Submarine Manufacturing and Products Ltd UK, in 2011.

In order to give standard training MDTI board of directors deemed it necessary to collaborate with the Nigerian Navy by signing a Memorandum of Agreement with the Nigerian Navy in October, 2011 to train commercial divers. The Nigerian Navy instructors are co-jointly involved in the commercial diver training programme of MDTI thereby giving the students proper physical fitness and self discipline. Upon completion of diver training programme, the students will

be issued commercial diving certificate jointly endorsed by the Nigerian Navy, this is first of its kind in Nigeria.

MDTI will commence the training of the first batch of student from the Federal Amnesty Programme by July, 2012. We would like to invite you to visit our campus, talk to our students and staff, and get to know MDTI. We are proud of our facility and what we do for our students.

RE-IMMERSION RECOMPRESSION?

Bob Cole

The author preparing to dive in Bikini Attoll

This is a pre-publication of Chapter 17 from Bob's new book 'Out of the Decompression Matrix' which is due out later this year.

Introduction

A question that I'm often asked is: Why can't we just put a diver with suspected DCI back in the water and recompression them? Well, I'll tell you, but it may take some time.

If you've just surfaced from a dive and say, you've missed a stop or two and you have DCI symptoms. What should you do? At first sight it would seem that re-immersion recompression would be the best and most logical option. After all it should be very quick, because there's no time wasted calling the emergency services and

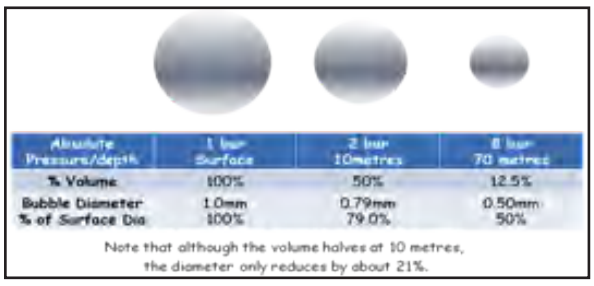


Figure 1

travelling to a hyperbaric chamber. It seems simple enough; the water can give you the same pressure as a hyperbaric chamber and you have breathing equipment etc on hand. So why not? When is said and done, the theory is that reducing the bubble size, by increasing the ambient pressure, relieves symptom and, at the same time, breathing pure oxygen allows better control over the elimination of the excess inert gas burden from body.

However, the standard answer given by all diver training agencies is: Call the emergency services for advice, give the casualty pure oxygen to breathe, re-hydrate them with still water, and don't try to repair the situation by re-immersion recompression. Why?

Usually, in the developed world, you are never too far from a hyperbaric chamber and competent medical help, but that may not be the case when abroad. They then go on to say that the potential dangers of using the do-it-yourself (DIY) approach is too difficult to control, thus making it more risky than waiting for the emergency services and it is

Figure 2

less effective. Sounds a bit thin and lacks detailed information, doesn't it? For this reason alone it bears some investigation, since Boyle's Law works during the ascent, growing DCI bubbles that you don't

want. So why not use it to crush these offending bubbles out of existence? Any diver will tell you, if asked, that the volume of a bubble halves if the ambient pressure is doubled. So re-immersing a DCI casualty to say 10-metres should halve the volume of the DCI bubbles. That's true, see Fig 1. But more importantly, this depth only reduces the diameter of a bubble by about 21%, which will not do the job! Even if the depth (pressure) were increased to say 18-metres (absolute pressure 2.8 bar), which is the current value used in hyperbaric chambers, the bubbles only diminish in diameter by about 30%. To reduce the bubbles diameter to 50% of its surface value requires a pressure/ depth increase of 8 times/70 metres, also see Fig 1. Furthermore, the reduction in bubble size is also related to the bubble's shape. A spherical bubble reduces its "volume" in accordance with Boyle's Law, but the "diameter" reduction is much less as discussed above. However, if the bubble is a long cylindrical shape and is re-compressed to that same magical 10-metre depth its length will be almost halved, but its diameter will remain unchanged, see Fig 2. The bubbles that cause DCI, it would seem, are unaffected by surface tension, which can be discounted. So it would seem, that compressing DCI bubbles by copying the hyperbaric chamber DCI treatment method of pressurising the casualty to 18 metres, 2.8 bar, in-water is beset with problems. This also includes the prospect of convulsions brought on by oxygen toxicity in open water!

Re-immersion using Air

If the re-immersed casualty breathes air during the treatment, not only is the bubble size reduction inadequate but the nitrogen in the breathing air will add to the existing inert gas loading in some tissues, which may be the slow more vulnerable tissues compartments and the bubble size may increase as the exposure time lengthens.

Standard Hyperbaric Treatment

Standard hyperbaric treatment has not changed for many years. Traditionally, the typical approach is to recompress the casualty to a depth of 18-metres ie an absolute pressure of 2.8 bar, whilst breathing pure oxygen. The commonly used Royal Navy and US Navy Treatment Tables both require over five hours at this depth (pressure).

At this point it is worth remembering the toxic effects of pure oxygen under pressure. To circumvent this difficulty the patient, in a hyperbaric chamber, is taken off pure oxygen every 25-minutes for a five minute air break, after which the oxygen therapy is restarted. This gives the body time to partially recover from the excess oxygen.

If the treatment were given in-water then the patient would need two breathing sets; one oxygen and the other air. The complications are increasing.

The Thermal Constraints for the Re-immersed Diver

There are a number of thermal issues to be considered when re-immersing a sick diver: The first is the water temperature. British waters are far too cold for any DCI casualty to tolerate given the exposure time required by RN/US treatment tables. But what about warm, tropical water diving? Well it's not just a question of water temperature; it's about a combination of temperature and exposure time. Furthermore, it's also about how much work the diver does during this exposure. DCI casualties do no work during treatment, irrespective of being recompressed in a hyperbaric chamber or by re-immersion.

The lack of physical effort and long exposure, even in tropical waters, will exacerbate the diver's feelings of being cold.

Exposure to cold causes the blood vessels in the extremities (hands, feet, skin etc) to close down {this is called vasodilation} to conserve body heat and hence this will slow inert gas elimination. Not a good thing for effective decompression. Treatment tables assume the casualty will be kept comfortably warm.

Dehydration

Dehydration is a contributing factor in many cases of DCI. Therefore, DCI casualties should be rehydrated - difficult to do in the water and at depth! The fact that the casualty and their minder (Oh, did I not say you will need a minder? Well you will!) are exposed for a long period of time underwater, and breathing cold dry oxygen and/or air, will cause them to dehydrate still further. This is caused via the lungs through so-called "insensible water loss" ie breathing cold, dry air, sweating and by vasodilation and the reduction of effects of gravity brought about by diving.

Medication

Treating DCI takes more than recompression and oxygen. Doctors may prescribe

intravenous fluids, anti-convulsive drugs, decongestants, steroids. Rather difficult to deliver underwater, even if you are a qualified hyperbaric doctor.

Finally

If all this doesn't convince you that re-immersion recompression is ill advised, consider the logistics. But first of all, keep in the front of your mind that bent divers are sick people! Re-immersing a sick diver requires an attendant to manage the in-water treatment. So another diver will be needed to dive with the casualty who, ideally, should be a doctor. Such a sick diver must re-immersed for more than five hours, which means that the attending diver must be relieved about every hour and the oxygen required for the sick diver and attendants will be enormous. You do the sums!

All this must be managed from the surface by attendants who record and managing the whole event, together with standby divers.

It's worth stating the patently obvious - DCI only occurs after diving, which usually means the attending diver and the stand-by divers are more than likely to have just completed a dive and are also loaded with inert gas. This means that there are at least two decompression situations to manage. Two sets divers, two sets of gas requirements! Unless both the casualty and the attending diver breathe oxygen during the first aid treatment of the sick diver, both will increase their inert gas loadings in some tissues - not a good idea! As already mentioned pure oxygen has its own problems and techniques.

Managing such events requires good clear, unambiguous communications between:

- Diver to diver.
- Divers and the surface and
- Surface and the divers.

Underwater communications are restricted by the water and the diving equipment.

In all my years of diving I've never seen a sport diving club with surface to diver communications suitable to match this task. I suppose that rope signals could work - but who knows the language and who has got suitable ropes?

Tides may be a problem. Since you've just finished a dive the tide may now be starting to run. Trying to hold station against a running tide can be extremely difficult if not impossible. It can all get very, very complicated! Let's hope the weather holds out, but what about the light. After all, this might be at the end of a day's diving! Furthermore, very few diving clubs take sufficient gas for such an episode or possess the skill to deal with such an event.

As discussed above, water temperature and the length of exposure means that each diver needs exceptional thermal protection for such an exposure, even in the tropics, again rarely considered by divers or their diving clubs.

To be fair, the same can be said for professional dive operations that manage live-aboard dive holidays or resort holiday locations.

Missed Stops/Fast Ascents without Symptoms - What to do?

Simply treat missed stops/fast ascents that are without symptoms with the application of pure oxygen, still drinking water, close observations and take advice from a hyperbaric doctor.

The Take Home Message

Keep in mind that re-immersion recompression is not a real option. Accidents happen, even to the best of us, so do a thorough risk assessment before diving. Easy words to say, but not so easy to put into practice. Prepare very well indeed. Remember the 6-Ps: Proper planning prevents piss poor performance.

Your planning arrangements should include sourcing first aid oxygen and someone qualified to deliver and a list of the hyperbaric facilities in your diving region. Identify how you will get a casualty to treatment eg route, means of transport, ie driver or drivers, if going by road. Keep in mind that DCI may hit your chosen driver - so you need a backup. Also note important phone numbers (hyperbaric chamber, hospital, coastguard etc). Don't assume that others have done this work for you, always double check with those in charge.

This is particularly important when taking a foreign diving holiday; ask the questions of your travel agent before you pay your deposit eg How much oxygen is held for first aid treatment, where's the nearest hyperbaric chamber and how to get there? If the travel agent says there is a chamber on site, ask what's type and size. I found this one-man chamber; see Fig 3, on a 1993 dive trip to Zanzibar. It's more like a pressure cooker that a hyperbaric chamber, it was outside in direct tropical sunshine, all day!

Figure 3. A Draegerwerk One-man Decompression Chamber in the mid-day sun.

Also ask if the dive operator uses bottled oxygen or does he rely on chemically produced oxygen, see Fig 4. If you get an answer that is less than perfect, don't hand over your money until you get a satisfactory response.

You now understand why re-immersion recompression is considered ill advised. But, you are intent on going on that remote diving holiday - what to do?

One of the best "remote" dive locations that I've been to is Bikini Atoll in the middle of the Pacific

Ocean, where there's no hyperbaric chamber and no hyperbaric doctor. They did, however, have lots of pure oxygen.

What did we do? Simple: we went diving, what else? However, we changed our decompression

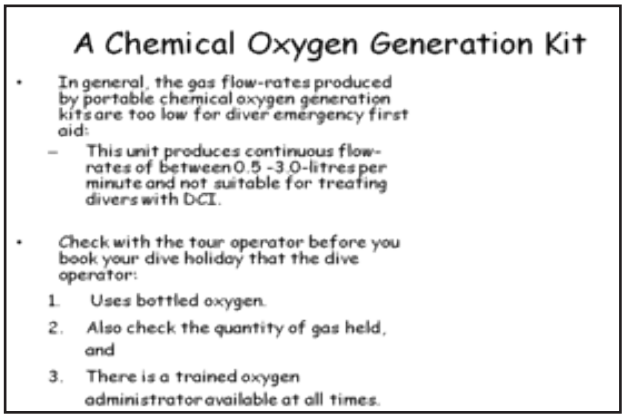


Figure 4

system. Nevertheless, the diving was a bit pushy: 40/50-metres twice a day, and sometimes on the USS Saratoga CV3 at 60-metres.

That said, ascents were very cautious. The dive breathing mix was air and the Stage-stops gas was 70%+ Nitrox. However, our PDCs were set for air so our off-gassing times were much longer than necessary, which made the decompression very cautious indeed. Furthermore, we kept a strict watch on hydration and drank no alcohol until the last evening of the trip.

To be fair this was all standard practice in Bikini, but we had made ourselves aware of this before deposits were paid. We also knew that the nearest hyperbaric chamber was a long flight away in the US Army base on Kwajaleine Atoll. But flights in and out of Bikini were every seven days.

So if you find yourself in a remote dive location, with or without a hyperbaric chamber or hyperbaric doctor, step back from the decompression edge and be very cautious indeed. Evaluate all the risks, put plans in place to minimise the dangers.

Always remember that decompression risk cannot be removed only reduced. Be sure you are happy to accept the risk. Don't let other people push you into doing something that you are not completely comfortable with.

Oxygen Administration Training?

It's a good idea, if you've not already done so, to get yourself O_2 trained. If you travel with friends try get them up to speed with O_2 Administration

Insurance

When arranging your holiday insurance, use a specialist insurer and insist that you get cover for DCI treatment and full repatriation with appropriate medical treatment. Don't let the insurance company get out of paying for any accident by ensuring you get insurance cover for your planned maximum depth, staying within your diving qualification limit and the agreed depth limit for the holiday.

ABOUT POMMEC

Pommec is a manufacturer and worldwide supplier of commercial diving equipment. The company provides equipment of all kinds, from personal diving gear to compressors, umbilicals, welding electrodes, decompression chambers and launch and recovery systems.

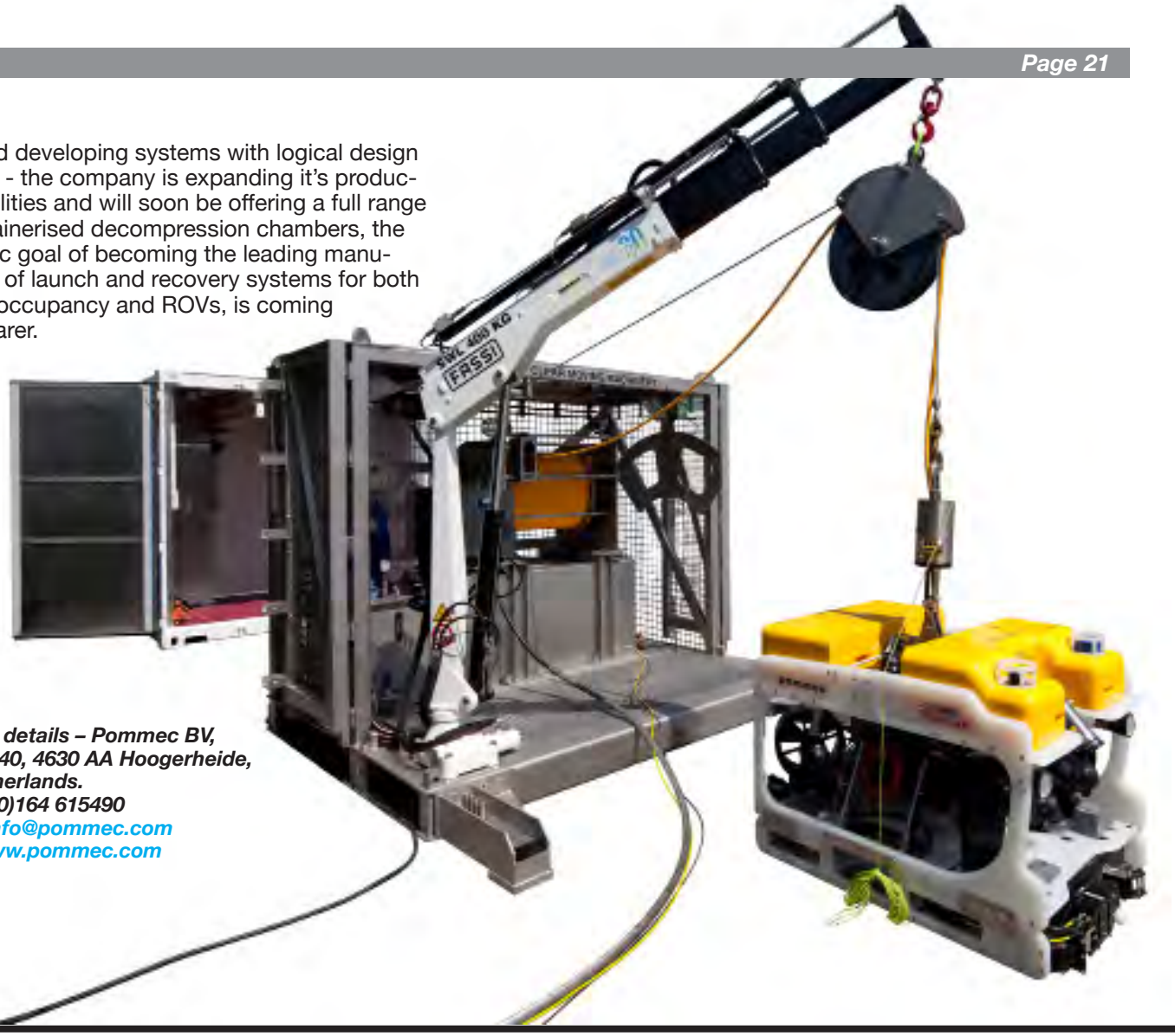
Additionally it specialises in building systems to the requirements of customers. Every customer has unique demands and want systems that follow strict guidelines - such as those set out by IMCA - and that have design and appraisal documents. Pommec makes sure that customers get what they need, and on time.

The Company's headquarters are in Hoogerheide which is in the Southern part of Holland,. The Sales Department makes sure that customers get what they want by working closely with the various departments of the company. quality, technical, electronics, hydraulics, logistics and welding, each with its own team of specialists. Services can also be provide on location, as customers are from all over the World, Vietnam, Mexico, the UK, Africa and others.

In the last 30 years or so Pommec has grown from a company producing cutting electrodes to a one-stop shop operation developing and manufacturing launch and recovery systems, decompression chambers and much more. However, it is still selling cutting electrodes and personal diving gear – that way it can offer customers the complete package.

As to the future, by using the latest technology, listening to the needs of customers, educating

staff and developing systems with logical design choices - the company is expanding it's production facilities and will soon be offering a full range of containerised decompression chambers, the Pommec goal of becoming the leading manufacturer of launch and recovery systems for both human occupancy and ROVs, is coming ever nearer.



Contact details – Pommec BV, PO Box 40, 4630 AA Hoogerheide, the Netherlands.
tel:+31 (0)164 615490
email: info@pommec.com
web: www.pommec.com

Interdive™ Services Ltd

The new premises

Interdive™ is moving (next door!)

The main classroom

Interdive™ Services Ltd, the Plymouth, UK based diving operations management and training company (and sister medical training company InterMedic™ Services) have occupied two buildings at the Stoke Damerel Business Centre since 2005 where their quality training courses are held. This year the tenants occupying 2 floors above Interdive in one of the buildings vacated to smaller premises in Exeter. The opportunity arose for Interdive to take over these additional two floors allowing all training courses and management to be "under one roof".

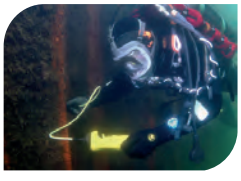
The additional floors provide more space and are stylish & modern and follow the Interdive's motto of "Safety through Training".

The company will be moving from 3A Stoke Damerel Business centre, next door to 3 where they already occupy the ground floor. The lecture theatre here will be relocated to the 2nd floor and the companies Closed Bell & Chamber simulators will be moved to this ground floor area (no mean task requiring some planning and co-ordination, removal of doors & walls and replacing after the move!)
In addition the administration department (ably manned by Vanessa & Jill who you have probably spoken to or even met!) will relocate to the spacious surroundings of the first floor. Anyone attending training courses or other business at Interdive will not need new directions as the premises frontage is adjacent to the old one!

For further information, course dates & prices, please contact their UK office or visit their website at http://www.interdive.co.uk

Tritex Multiple Echo Underwater Thickness Gauges

Measure metal thickness only and ignore coatings!



Simple

- Large bright **10mm** display for poor visibility.
- No zeroing required.
- Hand held tool - no awkward wrist mounting.
- No calibration at switch on.
- No removing coatings.
- One integral battery with 55 hours runtime.
- Can be upgraded to have topside repeater options by simply replacing the end cap.

Accurate

- Intelligent Probe Recognition (IPR) for enhanced performance.
- Automatic Measurement Verification System (AMVS).
- Single crystal probe to avoid 'V-beam' error.
- Can be calibrated for all metal types.

Robust

- Extremely rugged and robust.
- Pressure tested to 500 metres.
- Supplied in a Peli case.
- Protective membranes to prevent probe wear.
- 3 year warranty.

simple . accurate . robust

"It's a sensitive gauge that works well"
Red Sea Diving - Egypt

"We are very happy with the underwater gauge. Its display is very easy to see in all situations."
Shetland Islands Council - United Kingdom

"As a diver and engineer, I am very satisfied with the Tritex gauge...especially because the Tritex is easy to use...easy maintenance...robust and has a large and easy to read display"
Niras - Denmark

tritex ndt

www.tritexndt.com

Tritex NDT Ltd
Unit 10, Mellstock Business Park,Higher Bockhampton,
Dorchester, Dorset, DT2 8QJ, United Kingdom.

t: +44 (0) 1305 257160 f: +44 (0) 1305 259573 e: sales@tritexndt.com

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
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
Divers Academy International	USA
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
Hytech Netherlands	Netherlands
Pommec BV T.D.E.	Netherlands
Norwegian Association of Underwater Entrepreneurs (NBU)	Norway
Svensk Sjoentreprenad	Sweden

ASSOCIATE MEMBERS

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
Groupe de Recherche Archeologique Sous Marine (GRASM)	France
Institut National de Plongee Professionnelle (INPP)	France
Diver Ltd	Hungary
Darya Koosh Marine Co	Iran
Israeli Professional Diving Academy	Israel
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
Podvodrechstroy Diving School	Russia
Voronezh Diving school	Russia
Forespro	Spain
Oceanos Escuela de Buceo Professional SL	Spain
PROfessional Diving Services	Switzerland
Diving Diseases Research Centre (DDRC)	UK
London Diving Chamber	UK
Divers Institute of Technology (DIT)	USA
International Diving Institute	USA
Santa Barbara City College	USA

AFFILIATE MEMBERS

NAVFCO Military Diving School	France
Arena Sub Srl	Italy
NOS Nucleo Operatori Sommozzatore Societa Cooperativa	Italy
Eprons Ltd	Latvia
Nautiek	Netherlands
BPN Explorer	Poland
Podvoddiagnostika	Russia
Composite-Beat Engel	Switzerland
Aqua Mont Service	Serbia
Hydroweld	UK
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