

INTERNATIONAL DIVING SCHOOLS ASSOCIATION

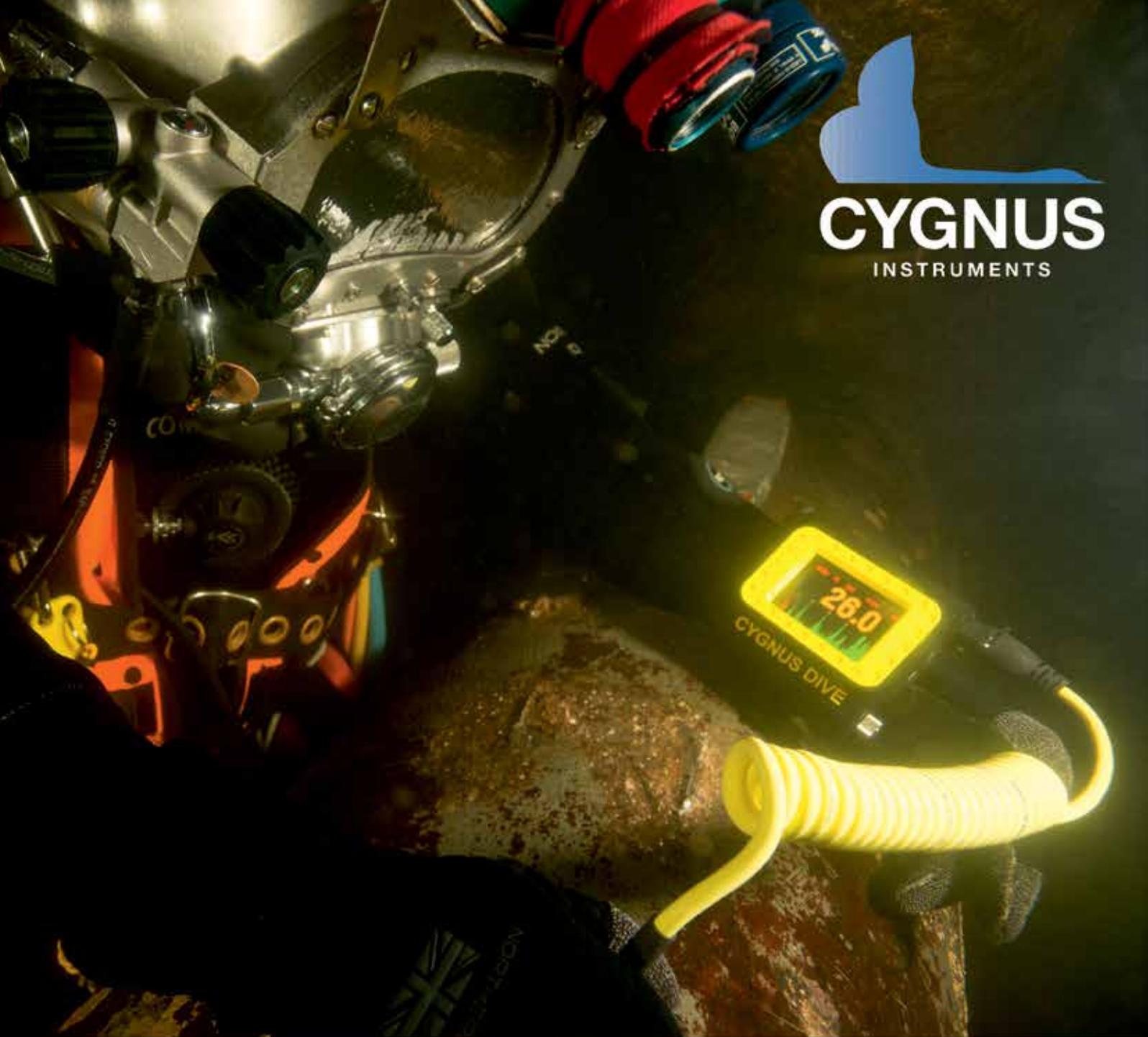
# iDSEA

**NEWS**

EDITION No 31 JANUARY 2018

- **DIVING IN A WARZONE**
- **UNDERSEA WINE CELLARS**
- **IMMERSION PULMONARY OEDEMAS**
- **TRAPPED UNDERWATER**





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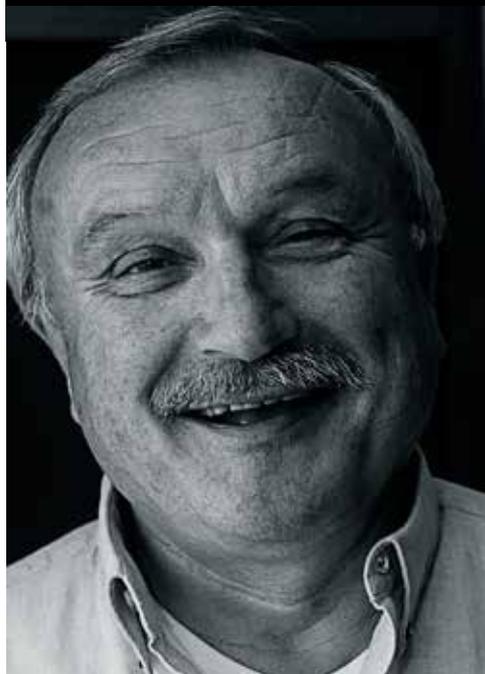
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## FROM THE CHAIRMAN



Dear  
Members

2017 was a busy year but 2018 is expected to be even busier with the re-certification of existing Full Members (Diver Training) and the certification of new members – and we are pleased to welcome new members:

**ASSOCIATE MEMBERS**

*Syntra AB Belgium*

*The Irish Sea Fisheries Board Ireland*

*KUdivers Marine Contracting Kuwait*

*Divetech Underwater Services United Arab Emirates*

**AFFILIATE MEMBERS**

*HS Water Solutions Srl Argentina*

*Divetech International Marine Services India*

I am glad to say that slowly we are becoming recognised more widely and are now represented on the Standards Development Group formed by the Irish Government to create National Diving Standards and on the Programme Committee formed by Montenegro, Serbia and Slovenia for the same reason.

The Board is at present considering a proposal to commission the writing of a training Manual designed to cover all the requirements of the Syllabuses for IDSA Levels 1, 2, and 3. As well as an IDSA Divers Logbook.

Our re-organisation of the Administration continues and Carin, among other things, has now taken joint responsibility with Mark van der Esch for the organisation of the next Annual Meeting which will be held in Treburden, North Brittany from September 25-27 2018.

We hope members will support this meeting, which will be our first in Brittany. Details of hotel and travel will be available shortly.



**A NEW IDSA AWARD HAS BEEN DEVELOPED - THE ALAN BAX AWARD**

– which will be presented annually. Part of Alan's changing role within IDSA is the support of schools interested in becoming IDSA members. As members will know, becoming a member is a long and complicated process and we are pleased to be able to offer support for this whilst keeping up high standards.

I look forward to seeing members and supporters in Brittany in September – please book early once you receive the details as this helps the Administration of what is always a difficult piece of organisation.

# The 35th ANNUAL MEETING, PALERMO

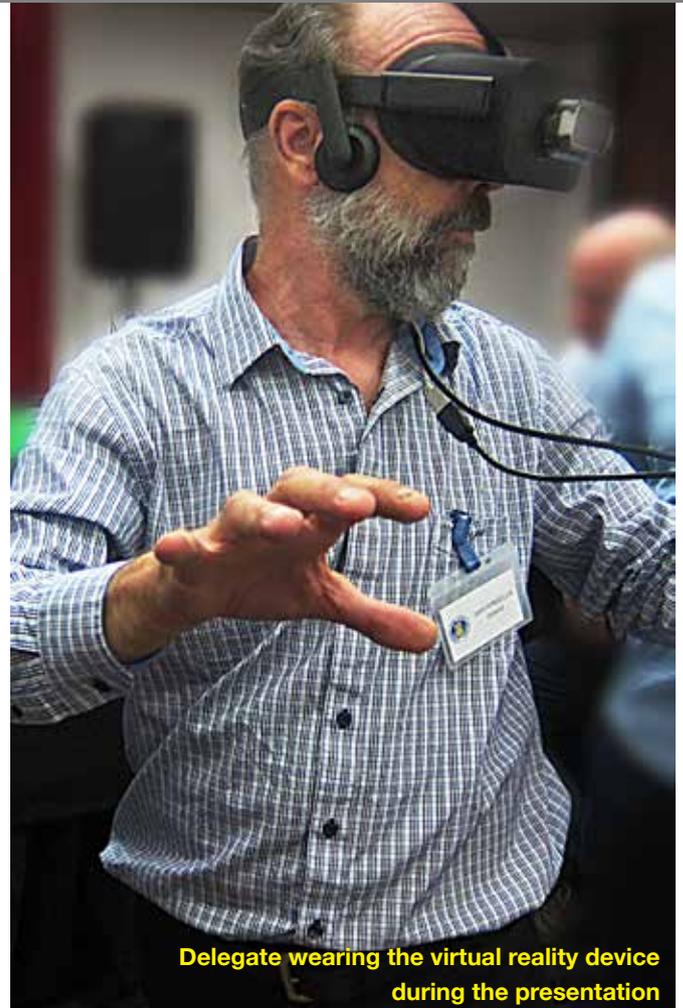
18/19 OCTOBER 2017



The meeting took place in the Astoria Palace Hotel in Palermo, which provided all the necessary facilities and was attended by 19 delegates from 10 Countries.

To begin the meeting Leo Lagarde was elected Chairman for further two years

The meeting was most purposeful and among the many matters discussed, were the implementation of an Award to be given at each annual meeting to a member who has made a significant contribution to the safety and quality of Diver Training in the previous 12 months. The award will be known as the



**Delegate wearing the virtual reality device during the presentation**

Alan Bax Award and the very first award was presented to Alan Bax out of respect for the work he has given to the Association over the past 35 years. The updating of our advertising and other materials is also underway and a new Wall Certificate which will be issued in 2018. A mobile banner is also available as shown in the centre of the group photograph.

Revision 6 of the Standards and Procedures, is nearly completed and the possibility of publishing it as a book is being considered, also under consideration is an IDSA Divers LogBook and an IDSA Training Manual linked to the IDSA Syllabus.

A Working Group was formed under the Chairmanship of Lars Wroldsen to decide whether or not it is worth developing a Social Media presence for IDSA.

It was also agreed that a memo should be circulated to members asking for the status of the Training Standards in their Countries. This has been done and 16 replies have been received. The result was that 2 countries accept the Standards formally, 13 have accepted them but without a formal agreement, and one country has not accepted them. The Board is considering further steps to establish more formal relations with their various diving authorities.

There was also a very interesting presentation concerning the use of training simulators by Lars Wroldsen from NYD in Oslo. The system which NYD are developing was demonstrated and was incredibly realistic.



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# THE 36<sup>TH</sup> ANNUAL MEETING OF IDSA

Trebeurden North West Brittany, France  
24 to,27 September 2018

Hosted by The CENTRE ACTIVITIES PLONGEES – (CAP)

Arrangements will be made for transport from Lannion to the Conference Hotel

Further early information may be available from this year's organisers :

**Mark van der Esch**  
[fraxinus.cmb@gmail.com](mailto:fraxinus.cmb@gmail.com)

Carin Bot:  
[post@idsaworldwide.org](mailto:post@idsaworldwide.org)

## The Conference Programme

Will be circulated early in April, or sooner.

## Accommodation

A group discount is being discussed with the Hotel and will be circulated as soon as details are known. All accommodation bookings must be made direct with the Conference Hotel.

## The Conference Fee

The meeting is open to members and non-members – the latter as observers. The Conference Fee is Euros 300 for each delegate from a member organisation and Euros 360 for Observers

*Members of the IDSA Executive Board take a break during their meeting at 'CAP' Trebeurden in August 2017*



**O**ur host School "CAP" is situated in the port and town of Trébeurden on the Brittany North sea shore renowned for its scenery and named the Rose Granit Coast. The meeting will be held at the Conference Hotel which is the 5 star Hotel L'AGAPA located in the town of Perros-Guirec Some 10km from the school.

Full details will be circulated shortly, but here is some early information

### Travel

The nearest airport is 'Lannion' about 540 KM West of Paris and some 8km from the Hotel

There is also a mainline (SNCF) Rail Station on the line from Paris in Lannion, and trains are fast and comfortable.

# DIVING IN A WAR ZONE

USACE oversees multi-national team's completion of Mosul Dam dive mission.

By Rick Benoit

**L**ake Dahuk, Ninawa Governorate, Iraq – Each day started as would any day at dive stations around the world; the team arrived at the job site, equipment and clearances were checked, safety meeting held, work began.

However, for the Drafinsub-Nautilus Joint Venture (DNJV) dive team working on the Mosul Dam, most days also included watching war planes, copters and drones buzzing overhead, rockets being launched from nearby hills, distant explosions and seeing billowing black smoke from the battles raging between Iraqi-led forces and the Islamic State (ISIS) in nearby Mosul City.

“The daily reminder of war, the sights and sounds of nearby battles certainly grabbed our attention. We could see, smell and hear war just about every day,” said Drafinsub Diving Project Manager Marco Vacchieri. “It’s hard not to notice when you have helicopters flying near our dive station with their gunners test firing 50 caliber machine guns into the lake. There were a couple of times when we all hit the deck and ducked for cover.”

Planning for Drafinsub-Nautilus JV’s mission at Mosul Dam began in December 2015, coinciding with the coalition’s military efforts to expel ISIS from Kurdish administered

four Italian-based international companies; Drafinsub of Genoa and its Venetian joint-venture partner Nautilus, Seli Overseas of Rome and prime contractor the Trevi Group of Cesena. Additionally, contractors worked with the United States Army Corps of Engineers (USACE) who served as Project Engineer, as well as Mosul Dam stakeholders the Ministry of Water Resources (MWR), Ministry of Electricity (MOE) and Iraq’s national government the owner of the facility.

For all in-water operations, the Mosul Dam Task Force utilized USACE lone personnel specially trained in saturation diving, deep diving and underwater construction inspection techniques and Todd Manny of Portland District and Rick Benoit of Transatlantic Division, Afghanistan, to provide both remote as well as on-site submittal review, diving, clearance, lock-out, tag-out, safety and quality assurance oversight.

“There were many kinds of challenging aspects to this job; one of the biggest challenges for me



northern Iraq. Underwater work, including sonar and video surveys started in September 2016 with full-time diving from January to July 2017, a time which paralleled the push by Iraqi and Kurdish forces to complete its purge of Islamic State fighters from nearby Mosul City.

During 19 months of planning and execution, the Mosul Dam Bottom Outlet Rehabilitation Project was a collaborative effort between



was the size of this project and working with so many different entities,” said Vacchieri, who holds degrees in Naval Architecture, Marine Engineering and a Master’s in Nautical Engineering from University of Genoa. “But most importantly, this project was being watched by three, if not four governments: Iraqi, Italian and American as well as the Kurds. And because of the urgency and critical need for repairs, it was like the whole world was watching our progress as we worked with a war going on around us.”

Drafinsub CEO Gianluca Passeri echoed the sentiments of his Diving Project Manager saying that a “special” aspect of the Mosul Dam Project has been the professionalism and positive relationships between contractors, project managers and government officials. “For this mission I cannot say enough about how well everyone worked together,” said Passeri, whose family-owned firm opened in 1977 as a small, shallow-water dive company. “It was due to the professionalism of Trevi, Seli, USACE and my team that made this mission’s success possible and allowed us to

work safely in a very dangerous area such as Mosul.”

The Mosul Dam, formally named Saddam Dam after Iraq's deposed President Saddam Hussein is the largest dam in Iraq providing flood control for the upper Tigris River plus irrigation and hydro-power electricity. At a height of 371 feet and nearly two miles long, the earth and concrete facility includes a powerhouse with four Francis turbines and a five-gate spillway. The dam also serves as a constant reminder of the area's violence and volatility showing battle scars from fire-fights between U.S. forces and Saddam Hussein's expelled government as well as from combat between ISIS, Kurdish and Iraqi forces.

Now an international community of engineers, scientists and government officials believe the dam's most critical battle is being fought, as Iraq's government with its consortium of nations and contractors battle to repair and save what's often been called "the most dangerous dam in the world."

Commissioned in 1986, geologically Mosul Dam sits on a karst foundation of soluble rocks such as limestone, dolomite, and gypsum. What concerns the international community most is that according to a 2007 U.S. government report, approximately 1.5 million people in the downriver cities of Mosul, Tikrit, Samarra and Baghdad would be imperiled if the dam failed. Additionally, according to that same U.S. report produced by USACE and the Special Inspector General for Iraqi Reconstruction (SIGIR), if the dam were to collapse, failure models predict that within hours of the breach, Mosul City could be swamped by up to 70 feet of water.

Although Iraqi efforts to stabilize the dam's foundations had been ongoing since the 1980's, several incidents including worker deaths, downstream sinkholes and seepage, led Iraq's government to concede international help was needed. In February 2016, Iraq signed a renewable 18-month contract with Trevi for a reported \$296 million to keep its dam from collapsing.

Besides drilling and injecting grout to strengthen the Mosul Dam's geologic foundation, Trevi's contract also called for an underwater inspection, repairs and rehabilitation of the facility's massive bottom outlet structure which houses two 2,500 feet long and 40 foot high by-pass tunnels, associated bulkheads, gates, mechanical and electronic controls as well as a downstream plunge pool.

Drafinsub-Nautilus completed its assigned work on schedule while planned drilling and grouting efforts both atop the dam and within its gallery section are ongoing. USACE also executed additional work engaging the U.S. Army's





### Diving in a Warzone (cont)....

569th Engineering Dive Detachment of Ft. Eustis, VA during July and August 2017 to provide follow up underwater plunge pool and powerhouse inspections.

Along with an extensive mobilization and de-mobilization, the Drafinsub- Nautilus JV team was required to provide multi-beam sonar profiles and remotely operated vehicle (ROV) video surveys of the dam's forebay as well as its downstream plunge pool. Also inspection and repair, removal and installation of four 40 x 20 foot, 70 ton bulkheads, installation of four 10 - ton mooring blocks and location and positional buoy systems.

During operations, DNJB worked 12-hour days, seven days per week aboard the 110 x 90 foot flexi-float barge Adriano which also served as a platform for the team's saturation system Raffaella. Most diving in this northern Iraqi reservoir was accomplished using surface-supplied air with Kirby Morgan 37's. About 10 dives were executed utilizing a two-person diving bell when depths approached 200 feet. All dives, which took place in the shadow of Turkey's snowcapped Mardin Mountain Range, required high altitude adjustments.

The Drafinsub-Nautilus joint venture team, which rotated its dive team roster of 25 about every 45 days, included Christians and Muslims from Italy, Egypt, Romania, Turkey, Iraq, Kurdistan and the United States each speaking either their native language or English with various degrees of fluency. Adding to the mission's social complexity were the various dive and work regulations DNJV needed to follow including those of the U.S. Army Corps of Engineers (EM 385), International Marine Contractor's Association (IMCA), Royal Institution of Naval Architects (RINA) as well as Italian labor laws and applicable on-site contractor safe practice manuals.

However, unlike other jobs experienced by the crew, work was completed under the constant watch of nearly 500 Italian

soldiers (Esercito Italiano) sniping behind 50 caliber machine guns mounted atop Iveco Defense Vehicles (IDV's). Briefly controlled by ISIS in July 2014, the Mosul Dam is located in Iraqi's autonomous region of Kurdistan and also protected by AK-47-carrying Kurdish Peshmerga security forces.

Despite the challenges of living and working in a war zone, blending a multi-cultural team and operating according to sometimes unfamiliar regulations, the DNJV team executed its mission without accident or incident for 11 months accumulating 3,492 work hours supporting 328 dives and 293 hours of diving.



"This was the most challenging aspect of our job; maintaining personnel safety for all of our people," said Passeri, whose 40-year old company specializes in deep-water and saturation diving for oil and gas companies. "This was also one of the more satisfying aspects of our job; the team's excellence and professionalism allowing us to work in a

very dangerous environment without any accidents."

In addition to daily reminders of noise and sights produced by the bloody urban war being fought 30 miles south in Mosul City, dive team members also battled temperatures up to 120 degrees, poisonous vipers, insects and austere living conditions. Daily, dive team members passed through multiple sand-bagged check points guarded by Kurdish and Italian soldiers traveling the four mile round-trip by bus between Lake Dahuk and their base camp where life was lived behind a ring of 20 foot high concrete T-walls below armed guard towers and strings of barbed wire.

And although there was no "official" opportunity to be "outside the wire" except when working, some members of the dive team clandestinely traveled into the barren, dust-choked hills surrounding the Mosul Dam bringing food, water and children's toys to displaced families and refugees escaping the fight in Mosul City.

"It all was extremely interesting work but humbling work in a very strange environment surrounded by war and soldiers with guns to protect us from ISIS. In the beginning, it was quite unsettling and uncomfortable," said Vacchieri, a 33-year old father of three. "But, like anything else, after a while you get used to where you are. Most importantly, being here made going home to my family in Genoa (which by the way is the most beautiful city in the world) very, very special."

**NOTE: The author served as Dive Safety Officer for the United States Corps of Engineers Mosul Dam Task Force in Iraq overseeing operations from November 2016 thru June 2017. A commercial diver, dive supervisor and instructor, Mr. Benoit, also served US-ACE Operations Officer at Bagram Air Field, Afghanistan and is currently assigned to the Corps of Engineers North Atlantic Division at Fort Hamilton, NY.**

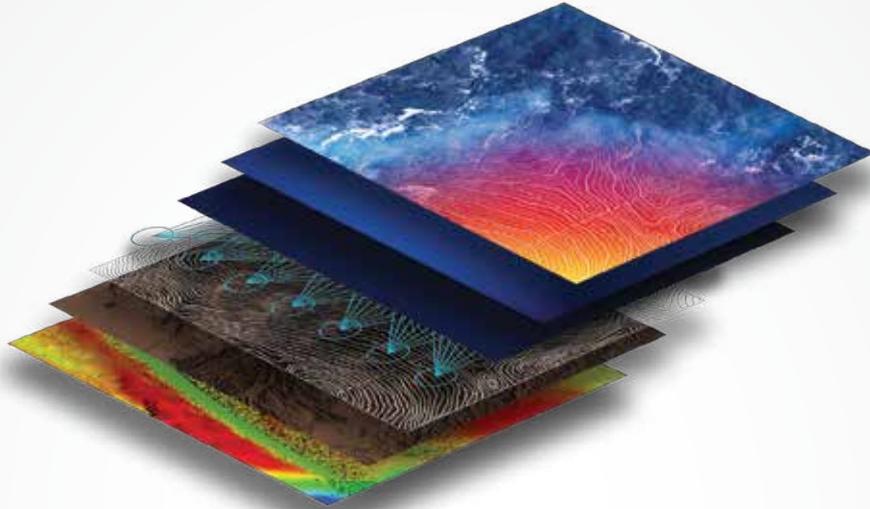
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# SAFETY

## CYLINDER CARE

### A WARNING

From Taira Caton ADC Secretary

#### Cylinder Explosion During Charging

**A**n ADC member has reported a serious incident involving an ex-military 25 litre aluminium storage cylinder. The cylinder was in a bank of ten aboard a vessel on route to a project.

The cylinder involved was in test with a working pressure of 205 bar and test pressure of 300 bar. This style of cylinder is in common use across the industry sector.

Two cylinders were being charged at the time, this process being monitored by an experienced compressor operator.

Whilst the charging was underway it is believed that between approximately 180 bar and 200 bar the cylinder exploded causing any loose items in the vicinity to be propelled around the cylinder space and other parts of the vessel.

Personnel nearby were injured by flying debris and the rupture caused serious leg and hand injuries to the compressor operator.

Substantial damage was also caused to the vessel's superstructure.

The injured personnel were provided with first aid assistance on the vessel and later treated in hospital. The incident was reported in accordance with RIDDOR.

The HSE together with manufacturers and industry experts are looking into the cause of the cylinder failure and this may lead to future changes in testing and/or in-use requirements of this type of cylinder.

Age and use related fatigue cannot be ruled out as two of the primary factors leading to the explosion at this stage. Further clarity on the prime cause may follow.

The diving contractor involved has withdrawn and destroyed ALL similar cylinders of this type

#### Recommendations:

The following factors should be carefully weighed up when dealing with high Pressure cylinders of any type:

**1. Consider the age of all your HP air cylinders.** (Although a cylinder may be in test and have good external and internal condition, they are still undergoing stress exposure on each filling and during the periodic hydrostatic testing. In keeping



#### The Association of Diving Contractors UK

The Association represents diving contractors who are involved with inland or inshore diving operations in the UK and Ireland.

with all plant and equipment, cylinders should be considered for periodic replacement, rather than waiting for them to be failed during inspection or testing).

**2. Understand the history of all bottles in your possession.** (DO NOT procure second hand cylinders unless the previous history is known, and full certificate history is available)



**3. Allow only trained, experienced and competent personnel to operate compressors.**

**4. Make sure you have a documented cylinder charging procedure and have completed appropriate risk assessments for the activity.**

**5. Ensure compressors are in good working order and have valid air purity test.**

**6. Ensure cylinders are Clearly marked with last test date and show max pressure.**

**7. Always minimise the personnel in the vicinity of cylinders being charged** (Blast containment cabinets are available where cylinders can be placed

during filling)

**8. Where possible always charge cylinders in a dedicated safe area considering what the consequences would be if a cylinder failure occurred.**

**9. Remove any loose materials and tools, from around the cylinder area, as these can be propelled great distance in a cylinder rupture situation.**

**10. Ensure whip checks are fitted to charging hoses and manifold whips.**

**11. Make sure cylinders are well supported so that they cannot topple over.**

**12 Try and standardise the working pressures of cylinders between storage and bailout bottles to avoid the potential for over filling errors.**

**13. Do not charge cylinders in enclosed spaces, ensure good ventilation exists.**

**14. When on site charge well away from any public areas, other working personnel or any flammable storage areas.**

**15. Never over fill cylinders to allow for cooling.** (Consider a 'topping off'

procedure for cylinders once they have properly cooled.)

**16. Consider the use of LP air for diving operations where possible, suitable or practical.**

**17. NEVER leave cylinders being charged unattended.**

**Summary:** This incident could have easily resulted in multiple fatalities. Although cylinder charging is regarded as a 'normal' activity for most organisations in the diving industry it is potentially one of the more dangerous operations carried out and should be planned and conducted to mitigate the associated risks.



# THE USE OF IN WATER STANDBY DIVERS

**F**ollowing a number of enquiries to the ADC office concerning the use of an in water standby and the confusion that seems to exist around this matter, it would seem to be appropriate to clarify the intent of the Inland / Inshore ACOP.

ADC were extensively involved in the development of the 1997 and 2014 Inland /Inshore ACOP and were in agreement with the wording that relates to this particular issue.

The 2014 ACOP paragraph 83 states; "A standby diver should be in immediate readiness to provide any necessary assistance to the diver in the water"

Adopting an in water standby approach would generally suggest that the second diver could be involved in some form of work or be on a separate task within the proximity of the primary diver, but who could be hindered from providing immediate assistance, and therefore MAY not be "...in immediate readiness...".

Where the divers are alongside each other in the water, conducting a survey or inspection task that does not require the use of separate tools, the task risk assessment could demonstrate that they are in close proximity, may even be connected, but effectively acting as each others standby. This status could be further enhanced by including reference to having a third diver on the surface, dressed in and in a high state of readiness.

ACOP paragraph 84 states; "The standby diver should remain on the surface unless required for an emergency. The standby diver should be dressed to enter the water, but need not be wearing a mask or helmet. This equipment should, however, be

immediately to hand."

The Association was advised by those involved in the development of the ACOP's, that the wording of the applicable paragraphs in the 1997 and 2014 versions were carefully considered. The intention being to retain the standby diver on the surface to enter the water in an emergency, and this was clearly intended to strongly encourage the contractor to adopt an out of water standby approach for all diving operations.

In circumstances where the addition of a second diver in the water is warranted, good working practice would necessitate that the team size is extended and a third diver is allocated to the role of standby diver on the surface, to be dressed in and at a high state of readiness. Clearly this action would necessitate a larger team than the indicated minimum.



## The Association of Diving Contractors UK

The Association represents diving contractors who are involved with inland or inshore diving operations in the UK and Ireland.



Notes By Bob Cole

# IMMERSION PULMONARY OEDEMA (IPO/IPE)

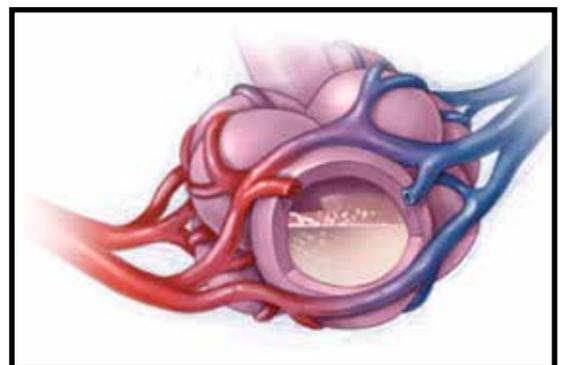
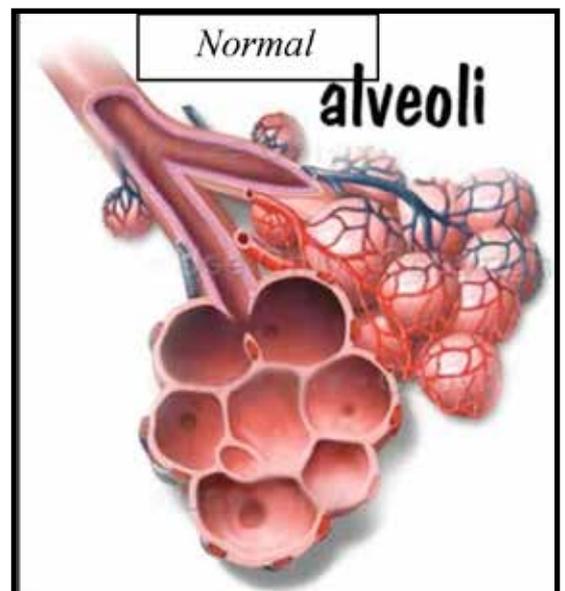
## **B**ack ground Info

Pulmonary oedema (Edema in the USA) is fluid in the lungs. A number of things can cause this fluid to accumulate in the lungs, but most have to do with the heart (cardiogenic pulmonary oedema); so not an issue for fit healthy divers then? Well you might come to that conclusion. However, there is some cause for concern. It seems that swimming/snorkelling/diving can cause so-called "immersion" pulmonary oedema (IPO) {or IPE in the USA – you may read in American publications (they spell oedema as edema) is a life threatening condition. It was first reported in 1989, that it can affect surface swimmers, including snorkelers, and divers. The precise cause is

unknown, because fatal cases are often mistaken for drowning. That is because in both IPO and drowning the lungs are waterlogged and heavy and post mortem findings can be similar. Most of the information about this condition comes from survivors, some of whom have had recurrent episodes.

One common problem seems to be excess hydration coupled with rapid onset of heavy swimming exercise on the surface. In triathletes who develop IPO, excess hydration and rapid onset of extreme exercise while immersed should be avoided. Military divers are instructed to avoid over-hydration before high-energy swimming. Divers are advised to ensure normal demand valve (DV) function and not to use regulators that are too tight to breathe from ie. high breathing resistance.

Breathing from a negative pressure that you may get if your DV is poorly serviced may contribute to IPO. If your DV is too tight to breathe from when you are working hard and you start to get breathless – STOP what you are doing, tell your buddy and recover your posture before continuing. Also consider ending the dive and surface in a controlled manner with your buddy. Furthermore, at



least one rebreather diver has been treated for IPO; it is thought that it might have been brought on by the work of breathing from the counter-lung.

If surface swimmers (ie people swimming with their heads out of the water) are over-hydrated, fluid (ie blood plasma) from the circulatory system may be forced through the alveoli walls into the lung's air space (alveoli) in the lungs by the hydrostatic pressure of the water. This condition can start during a dive and get progressively worse as depth is reduced to the surface.

#### **A number of factors increase the risk of IPO:**

If you have a pre-existing heart condition or experience hypertension (ie high blood pressure) get advice from a hyperbaric doctor and get him to give you a medical examination before you dive.

Immersion in cold water – WEAR the correct level of thermal protection. This can also happen in warm blue water: The length of time that you are exposed, even in so-called "warm water" (eg the Red Sea) is what's important. You

can lose a lot of body heat to the water and that may also contribute to IPO.

**Over-hydration before diving, water and other fluid:** Keep your hydration under proper control and don't over-hydrate before diving, instead have a rehydration drink as soon as practical after leaving the water.

More recently it was reported at a meeting of the Society of Underwater Technology that two divers who presented for treatment had overly tight dry suit neck seals, which may have restricted returning blood leading to their IPO.

#### **Warning Signs and what to do:**

If a diver becomes breathless underwater, (eg breathing in against a high negative pressure when using a rebreather with a back-mounted counter-lung) they must be accompanied immediately to the surface in the approved manner and landed to boat or shore ASAP. If a swimmer or diver becomes breathless get them out of the water as quickly as possible. Doing so will reverse the effects of hydrostatic immersion – so that blood moves out of the chest into the limbs.

Keep them warm and give them 100% oxygen to breathe. Get the casualty to hospital. Before returning to diving, after recovery, every individual MUST be checked out by a Hyperbaric Doctor, NOT a local GP.

With your head out of the water  
Hydrostatic pressure forces blood  
into the chest area.

Normally, this is OK, but on rare  
occasions if you're over hydrated  
and/or over breathing IPO can occur.

You know it's not a good idea eat B4  
swimming.

Likewise, drinking too much B4 diving is  
also thought to be a potential risk.





## ... AND NOW WINE UNDERWATER

Provence Vintners make waves  
with underwater wines.

*Photographs by J.M.Mille for Ecole  
Nationale des Scaphandriers (ENS)*

**V**intners in Provence have tried a new method of ageing wines by placing bottles under the water for a year.

French winemakers hailed their experiment as a success after tasting the 120 red, white and rosés from Bandol in south eastern France which had been kept 40 meters below the surface of the Mediterranean.

After being compared with 120 wines that had been kept in a cellar for 12 months, most connoisseurs said that they preferred the underwater variety.

Pascal Périer, director of the Enoteca Bandol, the local wine institute, said: “at the bottom of the sea, without light or oxygen and without vibrations the wine opens up better and frees up different aromas.”

Jérôme Vincent, director of the National School of Scuba Divers, who was in charge of the operation said: “We placed the bottles with care in specially created submarine boxes. The bottles were on the sand with wax around the corks, to ensure they didn’t yield under the pressure.”

Phillipe Faure-Brac, an award-winning sommelier, described the wines as “exceptional in complexity.” adding: “There is no light, there is no air, it’s relatively cool and the temperature is constant. The movement of the sea burnishes the structure of the wine”



The wine makers of Bandol are not alone in experimenting with underwater storage. Their counterparts in southwest France are now using similar methods, while Amphoris in Brittany is offering customers the chance to create their own underwater cellar.

The idea emerged when 168 bottles of champagne were found in 2010 on a ship that sank in the Baltic Sea 170 years earlier. They were in fine condition. However, critics said that deep-sea storage was unlikely to catch on because of the €13,000 cost of each batch.





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## THE BERGEN INTERNATIONAL DIVING SEMINAR

NUI AS, on behalf of The Association of Operators for Hyperbaric Lifeboat Reception Facilities, successfully arranged the 2017 Bergen International Diving Seminar on November 15th and 16th 2017 at the Clarion Hotel Bergen Airport. The seminar is a major professional and social event for the Diving Industry worldwide, Sharing of experience, knowledge and new technology is the purpose of the seminar.

169 participants from 77 Companies and Organizations enjoyed two excellent days in Bergen.

28 speakers from seven nations gave a very useful insight into what is going on in the International diving Industry, this included representatives from the Australian, UK and Norwegian Authorities.

This year the main topic for the Bergen International Diving Seminar was "Smarter solutions to address the industry's future"

The sub-topics for 2017 were:

- Our Industry today
- Industry development Challenges
- Evolution

If you want to see the presentations – Please visit us at [www.nui.no](http://www.nui.no)

The members of the Program Committee for the 2017 seminar were:

Cato Hordnes, Statoil (Chair)

Steve Sheppard, Helix

Øyvind Loennechen, TechnipFMC

Joar Gangenes, Subsea 7, Rolf Røssland, NUI

The promotor of the seminar, The Association of Operators for Hyperbaric Lifeboat Reception Facilities, has the following members, affiliated members and associated members:

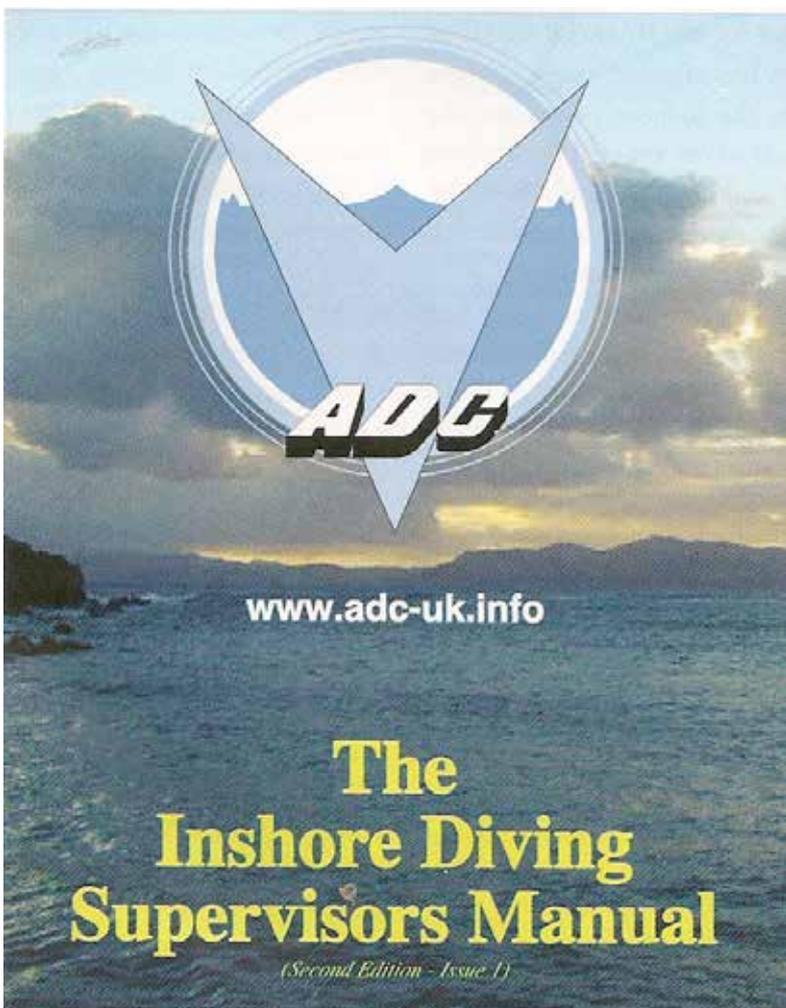
- TOTAL E&P NORGE,
- AKER BP,
- REPSOL NORGE,
- STATOIL,
- GASSCO,
- EXXONMOBIL (POINT RECOURSES),
- CENTRICA,
- SUBSEA 7
- TECHNIPFMC.

We are happy to announce that the next Bergen International Diving Seminar will be arranged for November 13th and 14th 2019, so please reserve these dates in your calendar to ensure that you can attend this well-established event.

The next NUI Diving Awareness Course will take place in Bergen on the 13th/14th of February 2018.

The course is designed to benefit such groups as: Project engineers, Marine crew, ROV personnel, Managers, Client reps, HSEQ personnel, Planners, Engineers, Buyers and other interested parties who might also benefit from learning about the advantages and limitations of diving as an intervention method when used offshore.

The course is a combination of theoretical and practical training and includes diving in a pool with fully-recognized offshore equipment, Iso diving in a chamber and an overnight stay in our saturation chamber complex where food will be served in the same way that an offshore diver might receive on operations.



## TECHNICAL INNOVATION COMFORT AND FLEXIBILITY ARE AT THE HEART OF BEAT ENGELS PHILOSOPHY

**T**he latest development of our diving helmets is the removable ballast weight. It's a solid cap, fixed on the diving helmet by two guiding studs and one security clamp which can be taken off and mounted again in five seconds. So the diver waiting on surface with full

equipment on has some eight kilograms less to carry on his head.

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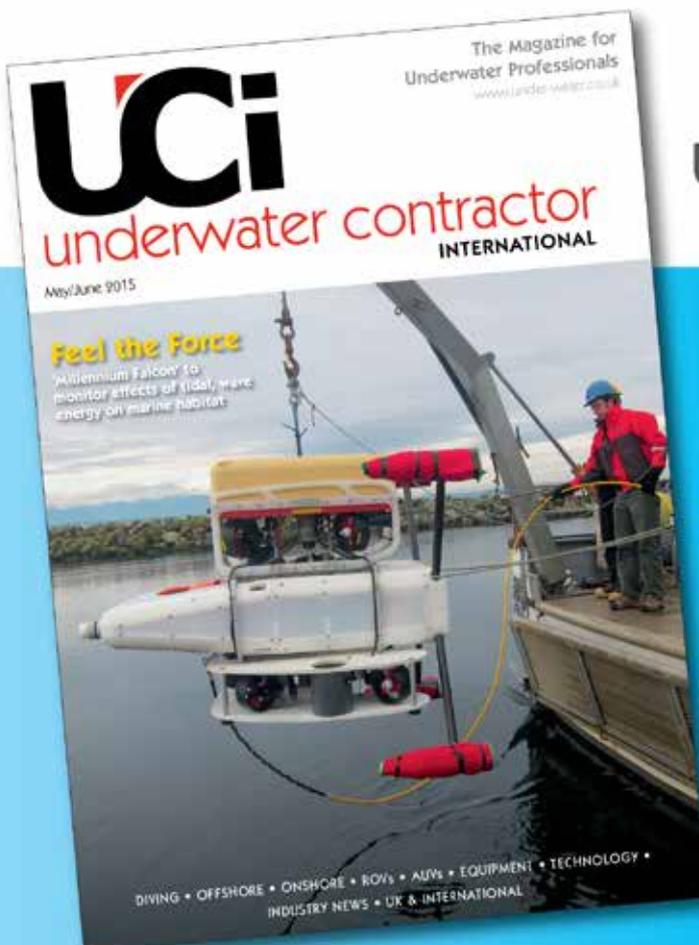
Divers come in different, head sizes, head shapes etc. In order to be able to cover a vast range of professionals, we clearly need to be able to customize our products: so that even a diver with an unusually big head or an unusual head shape will still be able to use one of our diving helmets. Key elements such as comfort, weight, user friendliness and advanced technical features are part of our daily work and philosophy.

Invention has always been in our DNA. For example, in order to simplify the work of professional diving teams, we developed our Rapid Airdiving Intervention System R.A.I.S.

The prototype has been given to several partners for testing and the feedback has been very positive. R.A.I.S. has now been added to our product portfolio for good. So has the removable ballast weight.



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# TRAPPED UNDERWATER

... he had to make a terrible decision.

Reg Vallintine talked to Norman Warren Owen and came away with one man's remarkable story.

**T**he isle of Anglesey is home to a number of distinguished seafarers and divers, but none more distinguished than Norman Warren Owen DSM, a hero of the World War II Malta convoys and survivor of a horrific diving accident.



*Norman's first diving job, building the new lifeboat house at Holyhead, Anglesey, September 1959*



*Norman with the team who helped build the lifeboat house. Picture 3 Norman posing in his gear*

The story begins in August 1942 when the tiny island of Malta was desperate for supplies, being isolated and under daily bombardment by enemy aircraft. A vital relief convoy\* was launched, protected by two battleships, four aircraft carriers, seven light cruisers and no less than twenty six destroyers. Even so, only five of the fourteen merchant ships that sailed through the Mediterranean finally got to the island.

Norman was a carpenter on the SS Deucalion and watched unbelievably as the aircraft carrier Eagle was struck by four torpedoes and sank within six minutes. He photographed the sinking never believing that his own ship would receive a direct hit just 24 hours later. He survived the subsequent attack but finished up on one of the Royal navy escorts, feeding shells to the guns. Battered down in the magazine while bombs rained down from above, Norman decided that this was probably worse than being on a civilian ship, so when the call went out for volunteers to help a stricken tanker, he was one of the first to go.

The tanker was the Ohio, which was destined to make the difference between survival and defeat for Malta. She had 11,000 tons of fuel and aviation spirit on board and, despite being a prime and extremely volatile target, had already survived one torpedo, the flames of a stricken tanker, collision with a dive-bomber and a burning Junkers 88. Before much longer she was set ablaze and considerably weakened by further bombing and torpedoes and was in danger of splitting in two. When her Captain and crew were taken off on two separate occasions to their amazement she did not sink, so when she was finally re-boarded it was to try and complete the most hazardous leg of the voyage.

No sooner had Norman and the other volunteers got aboard than she was hit by yet another bomb which destroyed her engine room and started another fire, although it missed the high octane cargo a Stuka dive bomber then knocked out her steering! The only way she could carry on was to be towed. This needed the combined effort of four vessels - a destroyer each side acting as splints, a third destroyer aft acting as a rudder and tug forward. As a trained shipwright, Norman's job

was to try and stop more water getting in and also to restore the wire toelines which parted repeatedly. They tried to keep their minds off the ships list, the gaping rent in her hull and the fact that she was so low in the water that when going ahead, her main deck was awash!

Finally arriving just north of Valletta's Grand Harbour, she almost drifted into a minefield! At the last minute more tugs arrived and they entered harbour, where the oil was frantically pumped ashore. Shortly after the last drop had gone she sank to the harbour bottom! Without her cargo it is doubtful whether Malta would have survived because the fuel oil and kerosene allowed the forces based on the island to go back onto the offensive. For their outstanding work and courage Norman and six others were awarded the Distinguished Service Medal from the King. Dudley Mason, as Captain of the Ohio, received the George Cross.

Five years after the end of the war, Norman was to make headlines again....

After the war he was working for the Blue Funnel Line in Birkenhead, when he got a message that the RNLI (Royal National Lifeboat Institution) were looking for experienced men to work on the construction of a slipway and lifeboat house. As this was back in his hometown of Holyhead on Anglesey, Norman jumped at the chance to avoid endless commuting. Once on the job he found that the team included a Cornish diver who was doing the underwater part of the work.

One Monday morning the diver did not appear and, as Norman had already tried out



the helmeted diving gear unofficially, the supervising foreman asked him if he would like to help out until the diver came back to work again. He never did return!

It took Norman a couple of hours to work out the basic technique of diving using one of the two six-bolt Siebe helmets they had, after which he found that he had landed himself with a job that took fifteen months to complete. Mastering the suits had taken him a little longer, as they both leaked badly around the corselette and slowly filled with water. When it was up to his knees, he had to surface to drain it out. One of the things he learned from others was that if his hands were freezing in winter, to push them into the mud on the bottom and leave them there for a couple of minutes to warm them up. He tried it and found it worked, as the mud retained some warmth.

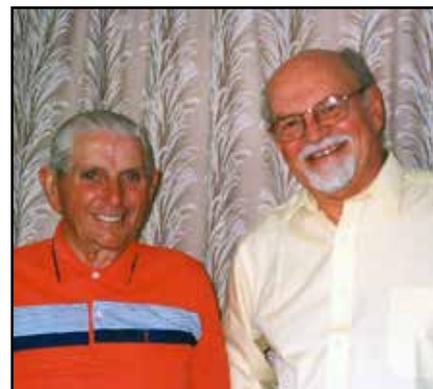
His success with the RNLI resulted in British Rail offering him a job as their Holyhead maintenance diver. This involved working at the base of a lighthouse and also in the fearsome currents at Valley Cob, where the water rushed through at 7 to 8 knots and diving was only possible during a 15 to 20 minutes window at dead low water. Several times Norman overstayed his time and got carried away, until his lifeline swung him back to the surface! He really enjoyed his diving, never guessing that his next job would end his career.

By July 1951 British Rail had decided to pull down a jetty that was no longer useful and their diver at that time had cut off the hardwood piles about three feet above the seabed. However, it now seemed that the remainder of the piles, driven some eighteen feet into the seabed, had also to be pulled out. They manoeuvred a one-hundred ton crane into position and Norman disappeared with an axe and other tools to cut a groove in each pile then fix a wire rope around it, so that the crane could pull it out. They proceeded successfully until one day, when the wire rope. Norman went down and that the rope had twisted, leaving a bight in the water. He held the pile with his right hand and caught hold of the bight to try and clear it. The next thing he knew, the fingers of his right hand had become trapped by the rope tightening around the pile.

His first problem was that he could not reach his exhaust valve, on the right hand side of the helmet, to adjust the air volume in his suit as enthusiastic pumping above was still filling it with air. The whole situation was rapidly getting out of control. Norman reached for his knife with his left hand. There was no chance of cutting the wire rope, so Norman began to saw through the trapped fingers of his right hand. Soon all he could see was blood billowing up! There was no sensation of pain, but he found that he could not get through the bone! He then thought of an alterna-

tive and made his usual signal for the crane to pull. The rope duly tightened but it only severed one finger, leaving Norman to continue tackling the bones of rest with his knife!

Suddenly he was free! He calmly collected his tools, surfaced slowly and passed them up to his tender, who was complaining of his late arrival back at the surface. Suddenly becoming aware of the blood, the tender turned white and had to sit down to recover! Others rowed Norman back ashore, helped him



**Reg Vallintine with Norman in 2001**

undress and he walked unaided to the hospital which was only five hundred yards away.

Norman sat in the waiting room. "What's wrong with you", they asked. "I've had an accident with my hand", said Norman. It was twenty minutes before they came to attend to him, during which time Norman recounts that the pain had increased tremendously! After it was over the doctors recommended that he give diving a miss. In all, his diving career had lasted twelve months!

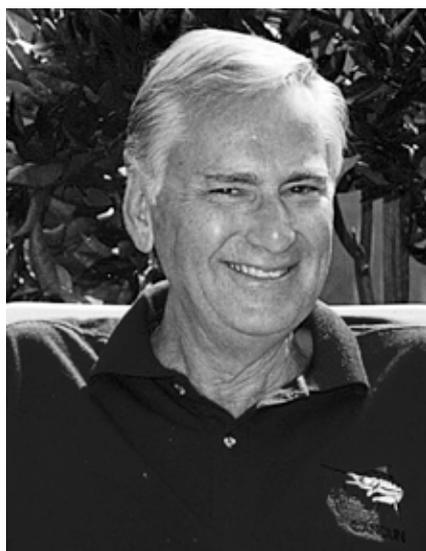
A year later he was awarded the Daily Herald newspaper's 'Order of Industrial Heroism' known as 'the worker's VC', for his outstanding courage and coolness.

At 85 Norman still leads an active life, sail racing every weekend. His sons have both taken to the sea. David is a Captain on the cruise line Saga Rose and a keen diver, while Edward is an Olympic yachtsman.

An account of Norman Warden Owen's wartime experiences was first published in Saga Magazine. The Maltese celebrated the sixtieth anniversary of what they call the Santa Marija convoy of August 1942 in 2002 with a reconstruction in the Grand Harbour. Convoy survivors were all awarded honorary Maltese citizenship, including HDS Working Equipment Group stalwart Jim Hutchinson. By all accounts none of the newspapers, other media in Britain, or the British Government, took an interest.

# SAD NEWS OF IDSA CO-FOUNDER JIM JOINER

It is with great sadness that we report the death in August of the the co-Founder and first Chairman of IDSA



– Jim Joiner.

After a fall, when he received a blow to the head, Jim was taken to hospital for surgery but was in a weakened state and died a month later. The day before his death his wife Susie tells us he had an enjoyable and happy visit from his children and grandchildren.

Following his leadership of the College of Oceaneering in Los Angeles, Jim moved to Flagstaff, Arizona to take closer control of his publishing firm 'Best Publishing' which many divers will know from its focus on technical publications for the diving industry.

Throughout his life, Jim has been supported by his religious faith and in recent years has been working as a volunteer with prisoners within the California Penal system.

We are grateful to him for his considerable contribution to the growth of IDSA.

After over forty six years of marriage Jim leaves a widow, Susie, four children, and eight grandchildren. Our sincere sympathies go to them in their loss; Jim will be much missed by all those who knew him.



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# A NEW LEASE OF LIFE FOR SHIPWRECKS

by Garry Momber

In 2017 the Maritime Archaeology Trust took over the management of the Isle of Wight Shipwreck Centre and Maritime Museum. The museum holds the Martin Woodward collection that consists of thousands of personal objects and artefacts from dozens of shipwrecks. Including material from the oldest boat building site in the world that was drowned as the sea level rose over it 8,000 years ago.

Ships have always led the way in human technological achievement. They have been the most sophisticated vehicles built by humans,

laying the foundations for global trade and communication. The remains of the ships that now lie beneath the waves represent a legacy to these past human endeavours.

The exhibition includes cannon, navigational tools, bank notes, bottles (still containing beer and rum), cutlery, crockery, golf balls, bicycle pumps, candles and razors all of which are from ships lost in the waters around the south coast of England. It is one of the largest collections of shipwreck artefacts anywhere in the UK and is of national importance in terms of maritime history, ship technology and marine artefact typologies.

The Maritime Archaeology Trust plans to develop the Shipwreck Centre over the coming years to tell the story of the earliest navigators, to the mastery of the world's oceans to the development of modern warships. This includes new educational facilities, enhanced interpretation and adding shipwreck displays that use the latest high tech visualisation technology including augmented reality and virtual reality.

**The Maritime Archaeology Trust is a UK registered, UNESCO accredited charity with a track record of research, education and outreach that stretches back over 25 years. It has an international profile with core activities focused around the southern UK.**

<http://www.maritime-archaeologytrust.org/>

<http://museum.maritimearchaeologytrust.org>



# UPDATE ON ITALIAN DIVING LEGISLATION

by Francesco Constantino

**T**he creation of a category of divers in charge of local port services was the only Italian legislation from 1979 to 2015 concerning divers. A document by the Central Port Authority of Leghorn in 2012, on the subject of the Costa Concordia wreck managed by Titan Micoperi, literally reads: 'In this regard, as it is clear from the above law, the ministerial decree of 13/01/1979, applies to divers carrying on activities in ports. As you may know, the Costa Concordia wreck lies outside the port area of Isola del Giglio.' The document highlights the absence of specific laws outside the port areas in Italy. In the years since 1987, 16 bills have been presented to the Italian Parliament, but none have ever been passed into law.

A solution was found in 2016 with the enactment of Regional Law no. 7 of 21 April 2016 'Regulation of educational contents for the practice of industrial diving,' which sets out titles and training courses, dividing them into three levels of qualification:

- first level (inshore diver), for up to 30 meters of depth;
- second level (offshore air diver), also known as the 'TOP UP' category, for up to 50 meters of depth;
- third level (offshore sat diver), also known as the 'saturation diver' category, for more than 50 meters of depth.

Moreover, Law 07/2016 emphasizes that titles can be recognized under Directive 2005/36/EC of the European Parliament and of the Council of 7 September 2005 across the entire EU. It also encourages the publication of an electronic database of trainees, in accordance with Article 3 of the Act, and the release of a personal card with all membership details, which can be defined as the ITALIAN COMMERCIAL DIVER CARD. In addition, it promotes the implementation of specific courses that are required to operate at any depth outside the port area, which has never been regulated in Italy.

There were immediate and different reactions at the Italian parliament. Some documents in favour of law 07/2016 of the region of Sicily, point out that '...the workers registered in the electronic database managed by the Department for Employment of the region of Sicily and holding the 'Italian commercial diver' card, may only be considered suitable for carrying on activities outside the port areas...'

However, the importance of Regional Law 07/2016 may be found in its applications at an international level. It correlates training standards (IDSA), operational standards (IMCA), and safety standards (HSE), highlighting that their proper application may increase quality and safety, and give Italian divers' qualifications more weight internationally, 'bringing the category to the level it deserves for its history and competence.'

These standards are different, but connected with each other and essential to ensuring the highest level of safety and quality in the management of offshore yards.

It is very important to underline that IMCA and IDSA have always been complementary associations in the sectors where they stand out.

In its document 'Reproducing the IMCA Logo', IMCA says:

There are only four training courses for which IMCA offers approval or recognition: Trainee air diving supervisor, Trainee bell diving supervisor, Assistant life support technician and Diver medic. Each requires a training establishment to apply for approval then satisfactorily undergo an audit of its documentation, facilities and course. Once IMCA has confirmed approval/recognition such establishments may use the wording 'IMCA Approved' or 'IMCA Recognised' in relation to these specific courses only

In this document, IMCA sets out its competence as a trade association that does not deal with training. None of the four courses it promotes can be considered 'wet'; in fact, they assist trainees in managing yards on the surface. Moreover, it is very clear that IMCA does not want to deal with the training of commercial divers, whether they are trained for port areas (OTS) or qualified to operate in inshore or offshore environments.

In general, IMCA is only interested in offshore areas, i.e. the moment in which diving is carried out with the use of specific equipment, such as basket, open bell or closed bell, which are real elevators for the safe descent and ascent of divers. The offshore industry is different from the port or inshore sector, where diving is carried out with the divers entering the water directly and with the use of the scuba (limited air source, which comes from the cylinder) or surface technique (unlimited air source, which comes from the surface through the umbilical cable). In offshore diving, dives may be carried out not only with the use of the above equipment, but also with the surface technique only. It is divided into two types: offshore air diving, which falls into the 'shallow water' category (also including diving in port areas and inshore diving) and is characterized by the fact that divers breathe common air (i.e. gas made of oxygen and hydrogen); offshore saturation diving, also called 'deep water', which is characterized by the use of gases made of oxygen and helium (eliolx).

On an annual or two-year basis, IMCA prepares a document whose first part contains the list of the countries that have specific legislation on these types of dives. The latest document produced by IMCA is Information Notes IMCA D 05/1505/15 (document no. 05 of 2015). In this document, countries that have legislation for offshore diving in their territory are listed and divided into three ranges.

Italy does not appear in this list, as the legislation existing until a few months ago in the Italian territory only set out the activities of OTS (port areas), in

which IMCA is not interested.

It is important to underline that IMCA has delegated three organizations for all other countries (including Italy): Interdive and the National Hyperbaric Centre that are in the UK, and KB Associates that is in Singapore. They should go to any of the countries that are not in the list on request, in order to evaluate the release of IMCA certifications for divers who work at companies that are IMCA full contractors. These procedures are defined by some IMCA documents, which indicate the rules to be applied; one of these is that only the IMCA full contractors that have employees with a lot of offshore experience, but do not come from one of the countries listed in document D05 -15, may request a visit by one of these three bodies. IMCA stresses that it does not want to assess expert divers, and does not intend to be such. IMCA believes that this type of approval should be carried out by governments or approved agencies such as ACDE in the USA.

It is interesting that these three organizations are IDSA Full Members as Diving Training Specialists, and that in paragraph 7 of a document entitled 'Competence Assessment of Surface Supplied Experienced Divers' addressed to these organizations, IMCA provides that they must work according to IDSA standards: 'The assessment should be based upon the IDSA standards - modules A (Preparatory), C (standard surface supply) and D (deep surface supply).' It should be also stressed that even according to the American body ACDE (Association of Commercial Diving Educators), IDSA standards are mandatory in training.

As mentioned at the beginning, this shows a strong connection, but also clear limits on competences. IMCA indicates the operational standards to be applied on yards, while IDSA sets out training standards to be applied during courses for commercial divers.

It also has to be considered that training has been delegated to regions in Italy and the region of Sicily is an autonomous region that can refer to its regulation, derived from an agreement between the Italian State and Sicily issued by King Umberto II with the Royal decree of 15 May 1946 (prior to the Constitution of the Italian Republic, which transposed it with constitutional law no. 2 of 1948), and gave birth to the region of Sicily even before the Italian Republic was born. Thanks to the Statute of Autonomy, the region of Sicily has exclusive competence on a range of subjects, including vocational training.

Now we must proceed so that even Italy, through Regional Law 07/2016, may be part of a future IMCA document replacing the D05 / 15 document, which may contain the phrase 'Italy: Registration in the 2nd level of the electronic database of the region of Sicily' in the first range ('shallow waters') and the phrase 'Italy: Registration in the 3rd level of the electronic database of the region of Sicily' in the second one ('deep waters'). It is important that this process was speeded up by Regional Law 07/2016, after 35 years without any laws. Italy and Italian operators in this sector have been last in global rankings; however, we are gaining ground, even with regard to the role we are entitled to play for our history and capabilities, thanks to all our friends who are working to achieve this ambitious project.

À L'OCCASION  
DE SES 35 ANNÉES  
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- Projection de films sur les métiers sous-marins
- Présentation des équipements et de leur évolution au fil du temps

# INPP OPENS ITS DOORS

In the 35 years since its inauguration, INPP has welcomed students from 98 countries worldwide to its range of underwater training courses. Set up originally under the leadership of Paul Gavarry, it has been fortunate to receive support from a number of national, regional, departmental, and city authorities, without whom such

## Eric Albier Institut National de Plongée Professionnelle (INPP)

progress and continuing existence would not have been possible.

Continuity at the Centre was ensured by the appointment of Eric Albier – firstly as a member of staff, following twenty years of service in the French Navy and then, on Paul's retirement, as Director. INPP is, of course, particularly well known for its deep water courses and hyperbaric training and, to date, has trained in the region of ten thousand individuals, both men and women, on its courses.

On its site, on the outskirts of Marseille, the centre's position allows it to work in close proximity with other professional groups with similar interests - such as COMEX, Civil Security, Survie Mer (Sea Survival) etc.; the teaching on some courses is shared - for example those for ROV and manned submersible pilots. as well as maintenance

Looking to the future INPP, now one of the world's major diving schools, has developed links with AFPA, previously a national centre for Sea and Maritime Studies, based in Brittany and using the old submarine base at Lorient. This new co-operation provides the new joint enterprise with access to both Atlantic and Mediterranean coasts. INPP is thus in an ideal position to move forward in the coming years contributing to the development of the French maritime economy.



**L'AVENTURE  
CONTINUE!**

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AUX METIERS SOUS MARINS

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## ABOUT IDSA

*The Association was formed in 1982 as a result of a meeting between Schools attending the American Diving Contractors Conference (Now 'Underwater Intervention') in New Orleans.*

- T**he aims of the Association were then, and are now
- To implement common International Standards of Diver Training
  - To provide a means of effective communication between schools.
  - To improve the quality of commercial diving education
  - To work towards improved standards of safety, emergency drills and procedures.
  - To provide a common and collective voice to government industrial agencies on any matter affecting members.
  - To co-operate on matters which may improve placement opportunities for graduates from member schools.
  - To promote any activity, idea or subject which furthers the international operations of the Association.

The Association is concerned with all divers - Offshore, Inshore and Inland - as well as non diving qualifications e.g. Supervisor, DMT and LST. The Association has established International Diver Training Standards based on the consensus opinion of its many

members, they are available in a separate publication. 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 standard will have the effect of;

- Equating Standards Internationally.
- Providing Guidance to Organisations setting Standards for the first time.
- 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 quality.
- Providing Divers with greater Job Opportunities.

Some governments have and will, set their own National Diver Training Standards. The IDSA programme provides a means of equating them by maintaining a Table of Equivalence - see the Publications section of the Association's Website.

# THE INTERNATIONAL DIVING SCHOOLS ASSOCIATION (IDSA) LIST OF MEMBERS

## FULL MEMBERS: DIVER TRAINING

Royal Danish Navy Diving School	Level 3	Denmark
Luksia Sukellusala	Level 3	Finland
Ecole Nationale des Scaphandriers (ENS)	Level 3	France
Irish Navy Diving School	Level 3	Ireland
Centro Studi CEDIFOP	Level 2	Italy
Netherlands Diving Centre (NDC)	Level 3	Netherlands
Norwegian Commercial Diving School, Oslo	Level 3	Norway
Western Norway University of Applied Sciences Diver Education (HVL)		Norway
Oceanos Escuela de Buceo Profesional SL	Level 3	Spain
Swedish Armed Forces Diving and Naval Medicine Centre	Level 2	Sweden
Yrgo-Commercial Diving School of Gothenburg	Level 3	Sweden
The Ocean Corporation	TBD	USA

## FULL MEMBERS: SPECIALIST TRAINING

Interdive Services UK  
 KB Associates Singapore  
 The National Hyperbaric Centre UK

## ASSOCIATE MEMBERS

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 University of Southern Denmark Denmark  
 Arab Academy for Science, Technology and Maritime Transport (AASTMT) Egypt  
 Egyptian International Diving School (EIDS) Egypt  
 Middle East for Commercial Diving (MECD) Egypt  
 GT Corporation SE Estonia  
 Faroe Dive Faroe Islands  
 Centre Activities Plongee de Trebeurden (CAP) France  
 Institut National de Plongee Professionnelle (INPP) France  
 Irish Sea Fisheries Board (BIM) Ireland  
 Diver Ltd Hungary  
 Israeli Professional Diving Academy Israel  
 Nahshon Marine Construction Ltd. Isreal  
 IDEA Kuwait Kuwait  
 KUdivers Marine Contracting Kuwait  
 Liepaia Maritime College Latvia

Regional Centre For Underwater Demolition (RCUD) Montenegro  
 Centre Mediterranee De Plongee Professionnelle (CMPP) Morocco  
 Almaghribia Marine Morocco  
 Seenergy Ocean Indien Reunion Island  
 Atlantis Marine Services Fujairah - UAE  
 Divetech Underwater Services Dubai- UAE  
 Gulf Marine Contracting FZE RAK - UAE  
 Santa Barbara City College USA  
 Divers Institute of Technology (DIT) USA

## RECIPROCAL MEMBERS

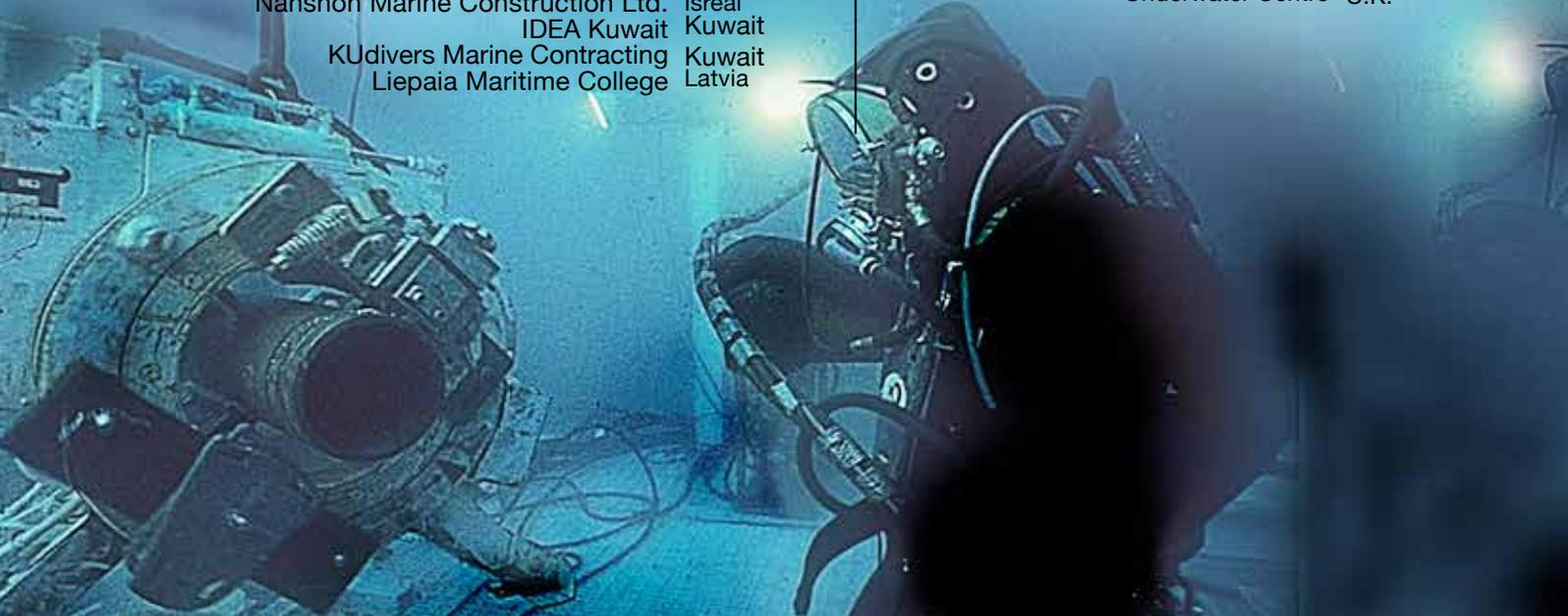
Association of Diving Contractors (ADC) UK  
 Association of Commercial Diving Educators (ACDE) USA  
 Association of Diving Contractors International (ADC I) USA  
 Alliance of Russian Diving Schools Russia  
 National Association of Hungarian Commercial Divers (IBOSZ) Hungary

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