

DIVING INCIDENTS SURVEY

Tim Parish - NDC Incidents Adviser

"Welcome to the most seriously depressing report at DOC95 - at least that's what it was branded by Diver magazine in its November edition. Unfortunately, Diver magazine went to press without waiting for the full facts to be checked and analysed. While some of its figures were right, most were incorrect and, overall, it hasn't been a bad year - so I hope you'll forgive me if I sound fairly positive for the next 30 minutes. This report may not have you rolling in the aisles I do promise that I will try not to depress you.

It is even more gratifying that the number of incidents has actually reduced this year - from 389 in 1994 to 351 in 1995. A reduction of about 10% despite the large increase in the number of dives carried out. Furthermore, the increased detail available from the Coastguard reports (our largest source of data) enable us to analyse some of the incidents far better than we have ever been able to before. This has had some fairly dramatic effects upon some of previous conclusions.

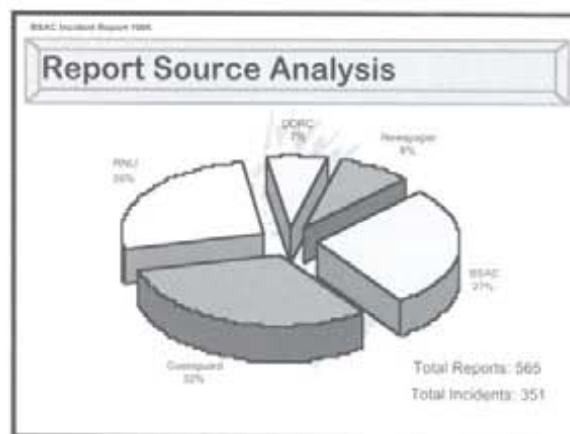
Apart from the rather disappointing non-appearance of data from the BHA the supply of data from our major sources has been exceptionally good, with 565 reports being received covering a total of 351 incidents. The Coastguard Agency, as is becoming usual, have supplied the greatest amount of data with 182 incidents being reported to us with significant amounts of detail for our analysis.

BSAC Incident Report 1995

Introduction

- Man-dives up to 3,000,000
- Incidents down 5 - 10%
- Better quality of data for analysis
- Number of fatalities up
- No data from British Hyperbaric Assoc.

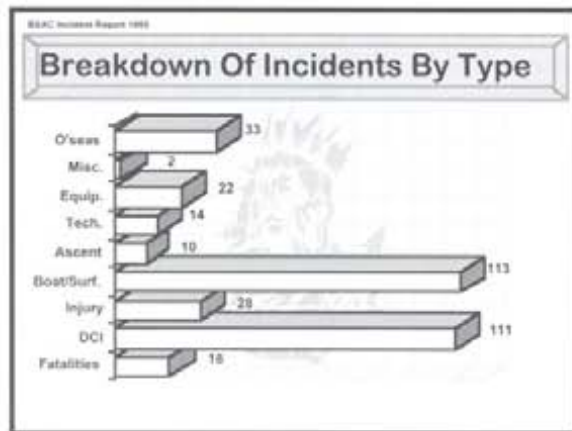
As I've just said, it hasn't been a bad year for diving and, with the good weather and the increase in the number of divers, current estimates are that over 3,000,000 man dives were conducted in the UK this year - a half million increase over 1994.



BSAC Incident reports are the second largest total, with 159 reports, closely followed by the RNLI with 152 incidents reported. These two are followed by DDRC, with their usual detailed breakdown of decompression incidents and our friendly press - who's accuracy usually leaves something to be desired.

I would like to point out that, even if we had received the data from the BHA it is extremely unlikely that the figures would have increased by more than 20 decompression cases - still leaving us with a reduction in the total number of incidents when compared to last year.

Looking at a breakdown of this data does not bring up any surprises. Fatalities in the UK this year have reached 18 this year, shown in the grey bar at the bottom of the graph. This is a large increase over the previous few years and has caused no little media interest - none of it of any good to our sport.



The second category, that of decompression incidents, and shown in the larger bar has shown a welcome reduction. We recorded 111 incidents this year as opposed to the 149 of last year.

Injury and illness also showed a reduction - only 28 incidents compared to 47 last year.

Boating & surface incidents, however, increased this year - by one! 113 incidents in 1995 compared to 112 in 1994. In reality I believe that this category has also reduced. Last year was the first year of the revised Coastguard reporting procedures and only supplied 9 months of data. This year we have received the full 12 months information.

Ascents accounted for 10 incidents, Technique for 14, Equipment for 22 and there were 2 miscellaneous.

This year, for the first time, we are categorising the 33 overseas incidents separately - and not including them in the statistical data. This is not because we are not interested - far from it, but the figures we produce each year are always quoted as UK figures and used to beat us around the head with. We have decided therefore to only include UK incidents in the statistics. Overseas incidents are still included in the report for people to learn from.

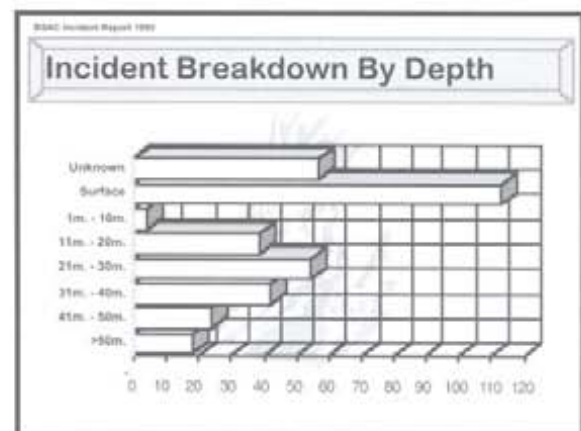
Over the past few years I have presented graphs just like this one, as did Chris Allen before me. The numbers may have changed slightly but the overall shape has stayed much the same. As you can see, the winter months are the least incident prone, but undoubtedly because the number of divers diving has decreased dramatically.



As we move towards Spring there is a gentle increase, until April that is. Then 'bang' - the second largest spike of the year. This in itself would be bearable if it was spread evenly through the month as it is in July and August. But it isn't. Most of these incidents happen around the Bank Holiday weekends as branches go away for their first sea dives of the season - for far too many members over the years it has also been their last!

June, July and August see the largest mass of incidents and, once again, this is not surprising. This is the main holiday season and probably sees twice as many man-dives as the rest of the year put together. It is the April peak that should concern us more and I'll come back to this later.

Depth has continued to be a major factor in all incidents. This year we have seen 18 incidents occurring at depths below 50 metres, compared to 9 in 1994. Now I don't believe that it has actually got any more difficult to dive to those depth than it was last year or even the year before that - therefore the conclusion we must draw is that more dives are being carried out at these depth ranges.



One of the factors that must be borne in mind is that technical diving has made these depths appear to be far more normal than they used to be. That has, in part, led to people attempting dives which are far beyond their training, experience and capability. Two divers died off Bo Fascadeale earlier this year attempting to break their own personal depth record - to below 75 metres on air. Their bodies were recovered by ROV some days later from 90 metres.

Apart from the deeper two depth ranges the profile has remained fairly static, again illustrating the fact that we are actually carrying out more dives to below 40 metres.

I now intend to run through a breakdown of some of the fatal incidents that have occurred this year and, hopefully, highlight

some of the factors involved. This year saw a total of 15 fatal incidents take place within UK waters, an unwelcome increase over 1993 and 1994. Even more disturbing was that three of these incidents were double fatalities, meaning that 18 people actually died.

The first was in Loch Fyne in November 1994 where a married couple left the surface and were never seen alive again - in fact the body of the man has still not been found.

The second involved 2 divers who are believed to have entered the engine room of the Breda, in Dunstaffnage Bay. Their bodies have not been recovered - Navy and Commercial divers consider the area of the wreck where they are believed to be to be too dangerous to enter. The third dual fatality was off Bo Fascadale, as I mentioned a few moments ago, when two divers attempted to get to 75 metres.

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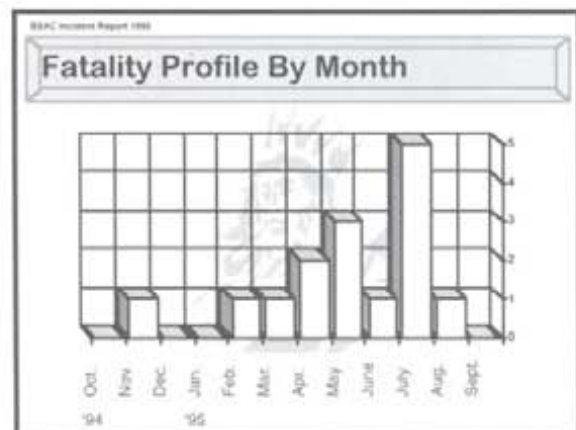
UK Fatalities - 1995

- ⇒ Fifteen fatal incidents in the UK
- ⇒ Three were double fatalities -18 deaths
- ⇒ Nine of these were BSAC members
- ⇒ Three involved dives below 50m.
- ⇒ Two more BSAC members died o'seas
- not included in UK statistics

Nine of the divers were members of the BSAC. This is perhaps put into better perspective when you consider that BSAC members make up roughly 2/3rds of the UK diving population.

Three of these fatal incidents occurred at depths in excess of 50 metres and to complete the picture two BSAC members died while diving overseas.

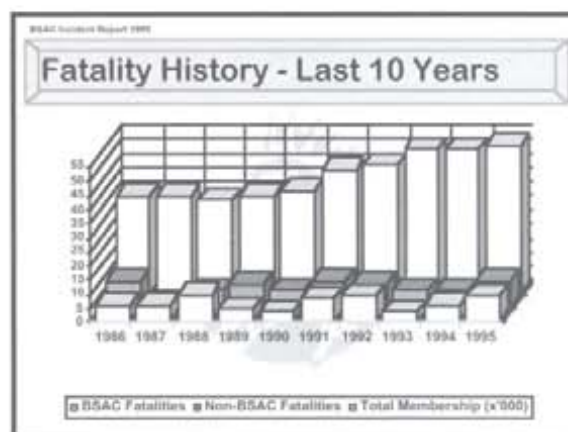
Just as a matter of interest, because we don't keep details in the Incidents Reporting Scheme, it is worth me pointing out the number of fatalities that have been occurring in the Red Sea, off the Egyptian Coast. At least 6 UK citizens have died there this calendar year - enough to cause the consulate in Egypt to ask the BSAC's opinion of what was going wrong. Most of these are occurring off dive boats, crewed by Egyptian crews who don't speak English and don't appear to know much about diving or boatmanship. Be careful if you are going out to that part of the



Studying the fatality profile throughout the incident year shows a broadly similar pattern to general incident occurrence, with 1 in November 1994, 1 each in February and March and 2 occurring in April (1 of which was the dual fatality inside the Breda).

3 Fatal incidents occurred during May, 1 in June (the dual fatality off Bo Fascadale). July was an awful month with 5 fatal incidents and August, thankfully saw just the one fatality. All in all it was not a very good year for fatalities.

Let us now take a brief look at the profile of fatal incidents over the last 10 years.



world and ensure that you plan and marshal your dives properly - it would appear that no-one else is going to!

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Let us now take a brief look at the profile of fatal incidents over the last 10 years.

As you can see from this graph, while we have not had a particularly good year compared to 1993 and 1994, the picture is not as bad as it has been painted in the press. The tall bars indicate BSAC membership (x1000), the darker bars are non-BSAC fatalities and the lighter ones are BSAC fatalities.

With a continuously expanding membership - up 2,000 to 52,364 on November 1 this year and with 1/2 million more man dives carried out, the fatality figures are no worse than in 1992 (17 fatalities, 9 of which were BSAC with membership figures of 45,626) and far better, statistically speaking, when you look at 1988 (16 fatalities, 10 BSAC, with only 33,000 members).

When you compare the ratios of member to fatalities there is a 50% decrease in the number of fatalities this year as there was in 1988. While that should make us feel slightly more positive about the number of fatalities the number is still far too high, and we all need to work together to try to bring this figure down.

One of the ways in which the BSAC plans to assist in this is to produce a monthly column in Diver magazine. This is not going to be a 'running total' of incidents, but will focus on safe diving

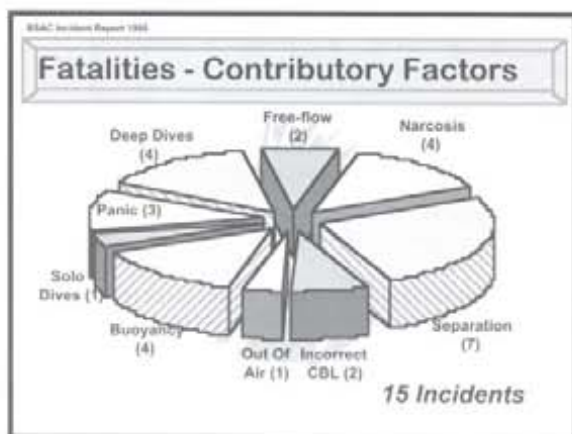
procedures and the avoidance of the type of incidents which are common during different periods of the year.

In order to start the process rolling, lets look at the main contributory factors in those fatal incidents that we have details for.

As you can see, the main factor running through the fatal incidents has been separation under the water. Seven incidents had this as a major factor, and when you consider that we have 3 incidents where the detail of the dive is not known that means that separation was a major factor in over half the UK fatalities. This is an area that we should be able to control and must improve on.

Deep diving, buoyancy and narcosis are the second most common factors each showing themselves as factors in 4 incidents (not all the same ones).

Panic, both underwater and on the surface, was the major factor in 3 incidents and free-flows and incorrectly handled controlled buoyant lifts were contributory to 2 each.



The incorrect controlled buoyant lifts are particularly frustrating. Both started with the casualty still alive, but the rescuer's tried to carry out the lift using their own buoyancy - not the casualties. On both incidents contact was lost during the ascent with the result that the rescuer arrived on the surface out of control and the casualty sunk to the seabed! The moral of these two incidents is clear - it must be the casualty that is made buoyant not the rescuer and if that means releasing the weightbelt then so be it. Get them to the surface by any means necessary - they can be treated up there - they can't be helped on the bottom.

Moving on to decompression incidents we see a better picture, with a decline in the number of people treated. Down from last years 149 to 111 this year. This decline has also been reflected in the data from DDRC and from The Coastguard Agency. The data received from the Coastguard is ever improving in quality, and I must thank Peter Brown for his efforts this year. The data has good detail for analysis and has thrown up some anomalies this year, which I will move to in a moment.

As I mentioned earlier, we did not receive the data from the British Hyperbaric Association this year. This means that our total number of decompression incidents is going to be lower than in reality. Looking at historical precedence and after talking to Surgeon Commander Francis at the Institute Of Naval Medicine (who maintain the data) this is likely to put our total numbers up to

around 130. Still a significant drop over last year. It is also

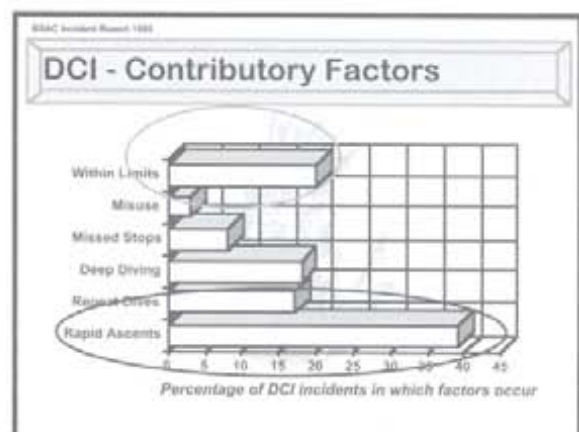
Decompression Incidents

- ⇒ 111 cases of DCI recorded this year
- ⇒ Improved data for analysis (Coastguard)
- ⇒ No data from British Hyperbaric Assoc.
- ⇒ BHA data likely to up the total to 130 'ish
- ⇒ No change to analyses - totals only

important to note that the BHA data is very sparse and doesn't give any detail for analysis. The lack of this data does not invalidate any of the analyses carried out, just the total numbers.



The incidence of decompression illness also follows the fairly standard profile, with a large spike in April over the Easter period, once again reaching it peak in the middle of the holiday season in July. If we look at the analysis of the contributory factors in decompression incidents we can see some interesting figures.



At first glance, this year appears like most years - but in fact there are some significant areas of change. This has mostly been caused by the analysis of the more detailed Coastguard data, and marks a significant improvement in our knowledge of what is happening

prior to these incidents. As a result Repeat Diving has leapt up this year, occurring in nearly 20% of incidents, as does the slightly higher figure for Deep Diving. Missed decompression stops have also increased.

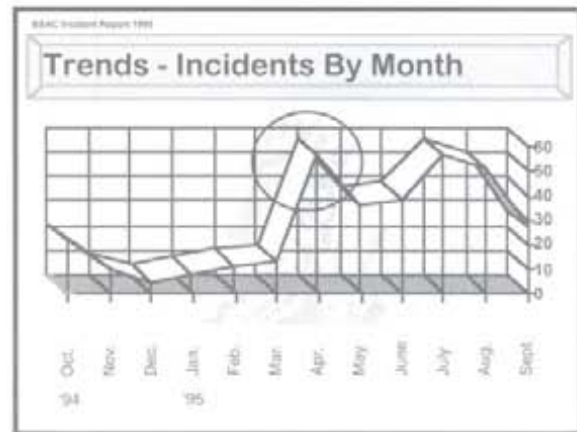
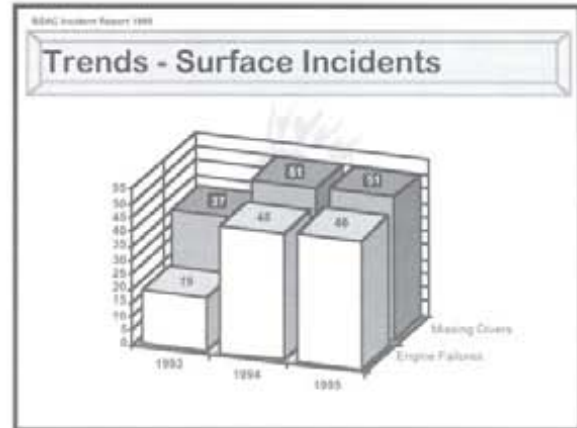
Keen Incident report watchers will notice that decompression incidents within the limits of tables / computers have almost halved. This has been matched by an almost equal increase here, in the number of rapid ascents.

For many years the number of decompression incidents occurring within the tables has hovered around the 37-40% mark - calculated from the information available to us. This year that figure is only 20%.

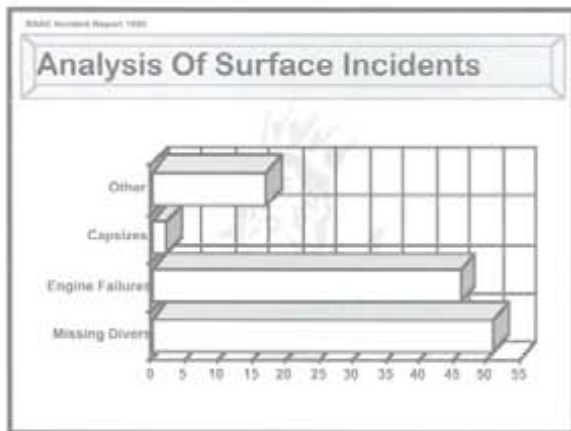
This year's figures show that Rapid Ascents have apparently increased from 25% last year, to nearly 40% this year. An almost direct reversal in percentage occurrence. If these figures are a truer reflection of what is really happening it gives us a far better chance to reduce the incident rate, by ensuring that ascent rates can be controlled properly. This is a really positive breakthrough. We could now look at a skill that we can train and practice - DCI within the limits is far more hit & miss and uncontrollable.

Obviously, I will be keeping an eye on this over the coming year, or years, to see if this is a real change, or just an anomaly. However, to do this properly, I do need the quality of data from both yourselves, DDRC and the Coastguard.

One of the areas of growing concern is the number of surface incidents occurring to divers throughout the year. This year has seen very similar figures to last year, and given that this is one of the areas we were trying to concentrate on, this has to be seen as relatively disappointing. The number of divers missing on the surface has remained at 51 this year and with engine failures standing at 46 that is the greatest proportion of the 113 incidents recorded.



following preventative measures. Firstly we need to educate our branch members and students that the early season, particularly the Easter period is an Incident hot-spot. We must take steps to ensure that they are practised in their diving skills and worked-up to the dives they are planning to carry out.



When taken together with evacuations to recompression chambers these incidents were responsible for 96 Search And Rescue helicopter launches and 152 RNLI launches. Most of these are caused by basic carelessness. If you compare the figures with last year's you can see that they are almost identical. This is an area which we must try to address.

Earlier in my presentation I showed you this graph, showing the incident breakdown over the year. I'd like to concentrate on this area for a minute or two, the Easter hump.

This is always a disappointing statistic, particularly so because most of the incidents occurring at this time of year are easily avoidable. For the next year we need to concentrate on the

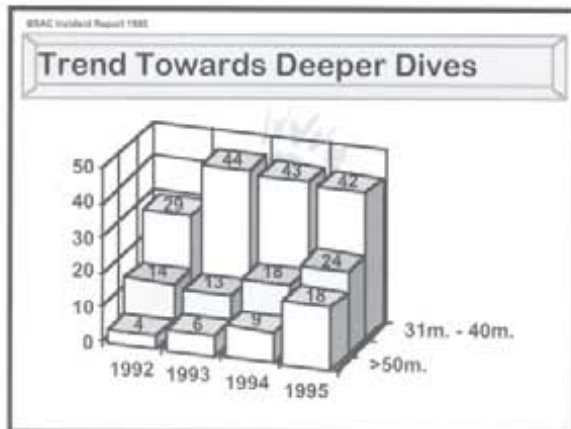


One of the easiest actions we can carry out is to make sure that all equipment, including club boats and engines, has been serviced - and then properly tested in safe conditions before the Easter dive trip.

As diving officers and instructors most of you are teaching and assessing rescue skills and keeping yourselves fresh and in practice. How many of your other members are? Its no use at all training somebody to do a Controlled Buoyant Lift and then expecting them to carry it out properly for the first time several years later.

Last, but not least, try to ensure that these early dives are marshalled by your better, more experienced, dive marshals. This is a critical part of the season and can set the scene and standard for the remainder of the year - lets make sure its sets the right example.

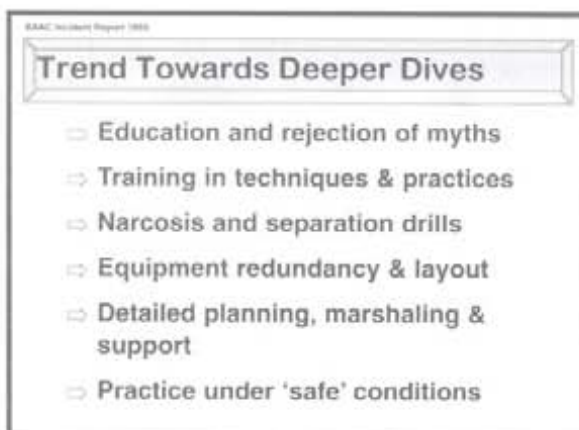
For the last three years I have been tracking the trend towards deeper 'average' dives. With 4 years data to analyse I can now show you fairly clearly that this trend is in fact growing - it isn't a figment of my imagination. There are two worrying factors in this, the first is that many of the divers carrying out these dives do not have the training necessary to conduct them safely, and secondly their equipment is not always up to the demands set at these depths.



We need to do something to address these points fairly quickly. We need to educate our less experienced divers on the realities of carrying out a deep dive, and dispel the myths that have been printed regarding depth records and 80 metre air dives. Yes, they have been done - but not by recreational divers on a weekend diving trip. There is a big difference and we need to emphasise this.

We need to train people in the techniques and practices required to carry out deep dives, deployment of decompression stations, use of 'bottom lines' and so on.

Narcosis is always a real factor in incidents occurring on deeper dives, and is probably a significant factor in underwater separation. Divers can work up their inert gas tolerance and with proper education can be taught how to overcome narcosis. By paying proper attention to their buddy, divers could decrease the incidence of separation. Separation drills should always be part of the dive plan and we must ensure that divers realise the importance of following them. It only requires self discipline.



The equipment used on a deep dive is significantly different to that used on most club dives. Redundancy and equipment layout are very important and this knowledge is gained from experience and practice as much as in the classroom.

Planning and marshalling deep dives is far more important than on shallower dives. Detailed plans need to be formulated for separation procedures, finding the shotline, air requirements, etc. The Dive Marshal must be aware of your dive plan so that he or she can effect an immediate rescue if required. Discipline is a key factor if safety is to be maintained.

Lastly, make sure that all these skills are practised in safe conditions before trying them for real. Its worth remembering that most of these skills can also be learnt and practised on the BSAC Advanced and Extended Range Diving skill development course.

When reading and analysing incident reports through the year several other areas that could do with improvement come to my notice and I'd like to highlight some of these for you now.

Buoyancy skills, or the lack of them, are a consistent offender in the incident database. We have already taken steps to increase these skills in early training - we must take the time to correct bad buoyancy skills during later diving as well. Just because you've signed them up doesn't mean that you can't monitor their skills. With the apparent increase in incidents caused by rapid ascents, this area becomes even more important.



Dive planning and marshalling seems to be getting worse, rather than better. The latest computer can still not plan your dive for you, nor tell the marshal what you are planning to do. These are critical skills and disciplines and we cannot afford to let them go to SEED, if you'll excuse the pun.

Several incidents this year have ended up with the casualty dead on the bottom, with their weightbelt still firmly strapped around their waist. We need to reinforce the teaching of weightbelt dumping. It is a basic skill and can be a lifesaver. It needs to be included in the 'buddy check' before every dive and not taken for granted.

There has also been an increase in the number of near-incidents where controlled buoyant lifts have not been too successful, due to air leaking from the neck seals of the casualty's dry suit. We must include information on how we can be lifted in an emergency within our buddy checks. Make sure that your buddy knows that he or she must use your BCD to gain adequate buoyancy, if that is the case.

Our boatmanship and surface cover skills are also in need of revision and further training, in order to minimise the number of divers who end up missing on the surface. Likewise, we must ensure that we carry location aids with us on a dive. The

Coastguard reports are full of cases where a diver could have been located hours earlier had they carried flares or even a strobe. Orange smoke flares are available in waterproof versions and are excellent visibility aids.

Let us also ensure that both our divers and our equipment are ready to go into the water.

In summary then, deep diving is increasing and we must ensure that those of us who wish to dive deep are trained in the necessary skills, particularly with regard to equipment and dive discipline. The BSAC Extended Range Diving course will cover many of these skills. We must reinforce core diving skills, buoyancy control, rescue techniques, weightbelt release, dive planning and marshalling. Ensure that buddy checks and pre-dive briefs are carried out in full - to include weightbelt release checks, the best way to lift you to the surface in an emergency, separation drills - its nothing new - we just need to have the self discipline to carry it out properly.

Lastly, particularly in regard to the early part of the season, we

must make sure that we are fit and safe to enter the water."

BSAC Incident Report 1991

Summary

- ⇒ Deep diving increasing - further training.
- ⇒ Core skills reinforcement - e.g. buoyancy.
- ⇒ Full 'buddy checks' and pre-dive briefs.
- ⇒ Pre-season service - equipment + divers.
- ☆ ***Remember - 20% of our membership is new each year - are they getting the message?***