DIVING INCIDENTS REPORT

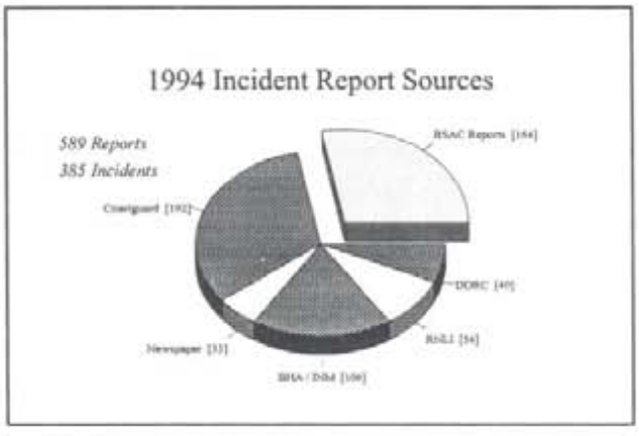
Tim Parish - NDC Incidents Adviser

"Good morning and welcome to the 1994 Incident Report. For the next 20 minutes or so I intend to talk you through the major incident areas for the year and discuss some of the trends and actions that have arisen from those reports.

If you pay much attention to the weathermen you will know that 1994 saw the UK basking in a long hot summer (a lot of which I seem to have missed). According to surveys of air stations and other similar sources we estimate that the warm weather resulted in an increase in the number of man-dives carried out. Up from 1¾ million in 1993 to 2½ million in 1994. This in turn has helped lead to an increase in the number of incidents when compared to previous years. 1994 sees a new high of 385 incidents logged into the database, derived from 589 incident reports. It is a good job for the BSAC that I'm not on a productivity bonus.

Not all of this was due to an increase in the physical number of incidents. A significant factor was a further increase in both the data sources and the accuracy of that data to which we now have access.

To put this into perspective, we received 164 Incident Report Forms from BSAC members, 192 incident reports from the Coastguard Agency and 106 from the British Hyperbaric Association (BHA), who's data is recorded and supplied to us by The Institute of Naval Medicine.



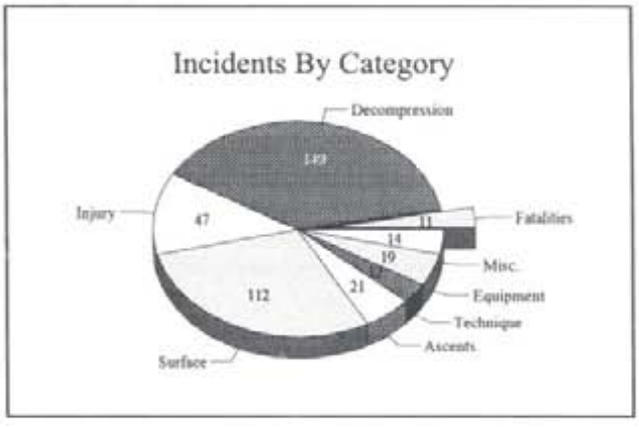
This was further added to by 33 newspaper reports, 54 reports from the RNLI and 40 directly from the Diving Diseases Research Centre. While we can never guarantee to collect 100% of serious incidents we are now probably as close to that goal as we can practically achieve.

It is, however, rather frustrating that much of that data cannot be used for detailed analyses - most of the other data sources keep summarised data only, or are restricted in what they can supply us with due to other considerations, such as medical confidentiality.

You should all have received a copy of this year's Incident Report in your delegate packs, those of you who were here last year may realise how much it has expanded - 31 pages compared to 24 in 1993. This is not just due to the increase in the number of incidents but also due to the extra detail I can now keep on the database. You will notice that the narrative of some incidents is much longer and more informative than previously published.

This enables you to gain more information from the incident, as long as I receive the information of course. I would obviously like to see a higher percentage of the incidents that do occur reported via the BSAC Report forms. It doesn't matter if you want to remain anonymous - as long as we get a breakdown of the incident.

While I mention the Incident Report it is perhaps worth mentioning that I have now removed the long table of analyses and statistics from the back page of the report. Several of you have mentioned that it was difficult to read and I had my own doubts as to the accuracy and relevance of the information contained within it.



If we look at the breakdown of incidents, by type, for this year we can see that there were 11 fatal incidents this year, one of them being a double fatality. Of those 12 divers that were the victims of a fatal incident 6 were BSAC members. This compares with 9 fatalities in 1993, of which 3 were members of the BSAC.

We have had 149 incidents of decompression illness reported to us this year, compared to 101 in 1993. This is nearly a 50% increase and is directly influenced by the number of dives carried out during the year. With reports from the Institute of Naval Medicine, the British Hyperbaric Association and the Coastguard we can be sure that we are not missing many incidents nowadays. There are still some chambers that do not send in their reports to the BHA database. Most of these we believe are captured by BSAC incident reports and Coastguard evacuation reports - we should now only be missing a minority of 'walk-in' casualties.

The number of injuries has apparently doubled in 1994, from last year's 23 to this year's 47. I don't believe that this indicates a sudden lack of care from the membership, but is probably as a result of the ever increasing amount of legal actions being taken against branch officers and committees. It is worth remembering that in cases of personal injury or damage to property the BSAC Incident Report is your notification to the BSAC and its insurers that an incident has occurred. Diving Officers and branch committee members should remember that these reports should be submitted to the BSAC within 3 months of the incident, in order to ensure that your 3rd Party liability cover is not affected.

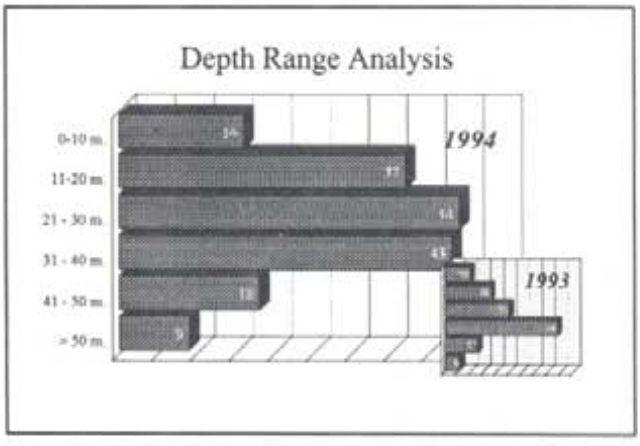
Once again we have seen a large increase in the number of surface incidents during the year. This increase, up from 73 in 1993 to 112 in 1994 can be almost directly attributed to the

good weather and sea conditions that existed for much of the year.

The breakdown is completed by 21 Rapid Ascents (with no other ill effects), 12 incidents involving examples of bad diving technique, 19 equipment related incidents and 14 that have fitted into the miscellaneous category. These latter incidents include two incidents for which Safety Awards will be made today, requests to the Coastguard for medical advice, and other incidents which do not fit into the major categories.

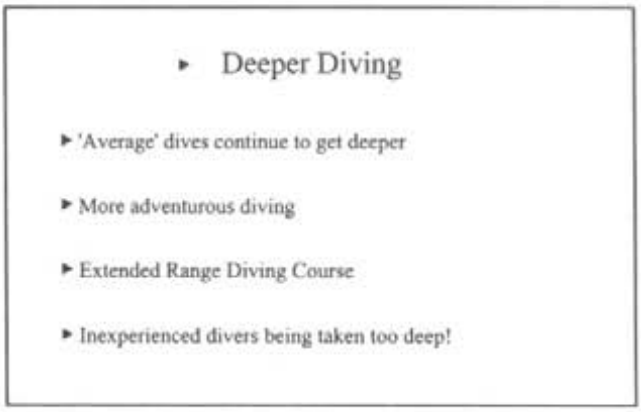
The pattern of incident occurrence has changed slightly this year. Incident Report watchers amongst you will know that we usually see a spike at the beginning of the season, around the Easter and May Bank Holidays. That spike was considerably reduced this year, particularly for decompression incidents. The reason for this was probably the storm force winds which ravaged the coasts of this country during the Easter holidays, keeping most sane divers at home in bed (or perhaps in Stoney Cove). The storm did not deter one set of hairy chested medical men going out to sea. Torbay lifeboat had to rescue them after they set out to sea in their club boat, only to have both engines fail - in a wind that measured Force 10 on the Beaufort Scale! I don't doubt that I will come into contact with them again.

In comparison with 1993 and previous years, however, the general incident pattern, and the number of incidents is very similar throughout the year. Until, that is, you look at June and July, which have increased considerably over previous years.



In comparison with 1993 the depth pattern at which incidents have occurred has thickened out in the 10m to 30m depth ranges, as you can see from the comparative graphs on this slide. The 1993 data is shown on the smaller, inset slide. I believe this to be a factor of the good weather once again, tempting the less experienced, less hardy and less adventurous diver into the water more frequently during the summer. This is also a possible cause for the large spike in incident frequency we saw on the last slide in June and July. The number of incidents in those depth ranges has risen from 18 to 37 in the 10-20 metre range and from 25 to 44 in the 20-30 metre range.

In comparison you can see that at the depths where the more experienced and more adventurous divers are carrying out their dives the increases from last year to this are far smaller. In fact the 30-40 metre depth range has dropped from 44 to 43, the 40-50 metre risen from 13 to 18 and the 50 metre plus range from 6 to 9 (and one of the latter includes a diver on Trimix). These changes are insignificant when compared to those at shallower depths. We can, therefore, begin to pick out some similarities between the figures we have seen over the previous two years and this years' data, identifying some patterns.

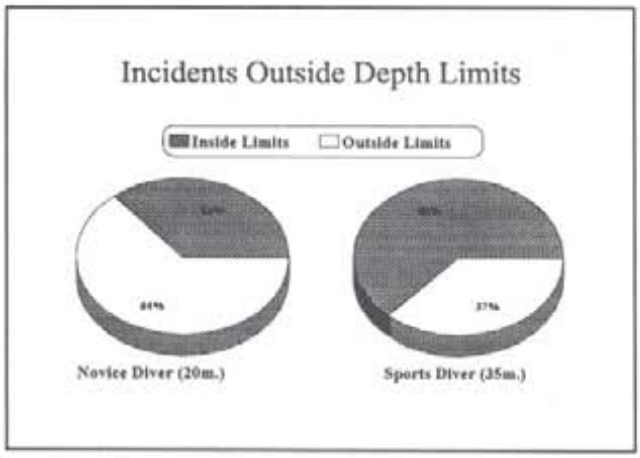


The trend towards deeper diving, first highlighted last year has continued. When you question your fellow divers most of them will agree that their own branch is now doing dives that they would have been very wary of doing in previous years. This has been helped by the advent of larger capacity cylinders, higher performing regulators, dive computers and better thermal insulation and a higher standard of general training. To put it simply, more divers are going there because they can. While the element of risk is still very much present in dives to depths of over 40 metres the risk is considerably reduced when compared to 10-15 years ago.

Branches are also organising and running more adventurous dives than they ever used. The BSAC expedition scheme has opened up a lot of new diving areas and made people aware of what is possible. This, together with the increase in the number of First Class Divers, has led to more people being capable of leading such expeditions at a branch level. One of the things that has not changed in order to keep up with this trend is the training necessary to undertake this type of dive. Many branches have had to 'redevelop' the wheel in order to learn the skills of deploying stage bottles and suitable shotlines for carrying out extended decompression stops. This inexperience and lack of formal training has, in the past, incurred extra risk and been the cause of several serious incidents. Next year the BSAC will launch a new Skill Development course, on the subject of 'Extended Range Diving'. This course will be explained in detail by Jack Ingle tomorrow, and so I will not say any more about the course now.

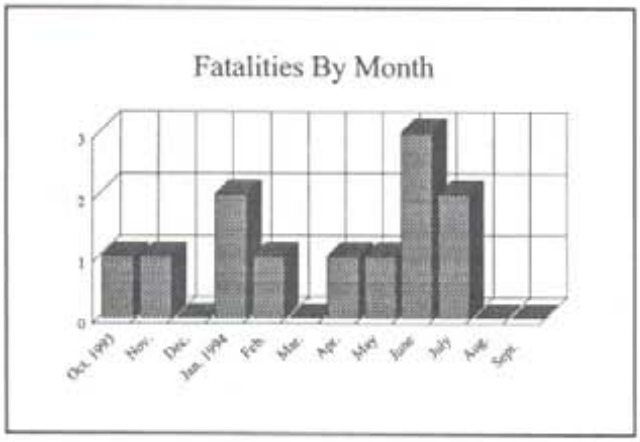
This year I have been able to further analyse the data I have received to gain further information about some of the patterns we can see in series of diving incidents. One of the most disturbing of these is the increase in the number of

inexperienced divers that are being taken to a depth greater than that for which they are ready. If we analyse the number of serious incidents affecting Novice Divers and Sports Divers below the surface we can come up with some very disturbing figures.



During the 1994 incident year 26 Novices were involved in serious incidents, including being the victims in two fatal incidents. Out of these 26 incidents 17 occurred at depths greater than 20 metres - the recommended limit. That equates to a percentage of 64% being taken deeper than they should have been. In mitigation some of you might say that there are Novice Divers and there are just plain Novices, however it doesn't say much either for our judgement or our standard of care when you think in over two thirds of those incidents the victim shouldn't have even been there. We are, after all, Diving Officers and Instructors. Our Novices and trainees trust us to look after them. Some of us are not doing a very good job. In addition some 41 Sports Divers were involved in serious incidents, 15 of which occurred below the 35 metre recommended depth limit. We must ensure that when the branch goes diving the dive marshall is adequately qualified and can take the responsibility seriously. Being an Advanced Diver is not enough - he or she must be able to say No, and mean it.

That's as much as I'm going to say regarding the general analyses. I'd now like to move onto the more detailed analysis of the major incident categories - starting with fatalities.

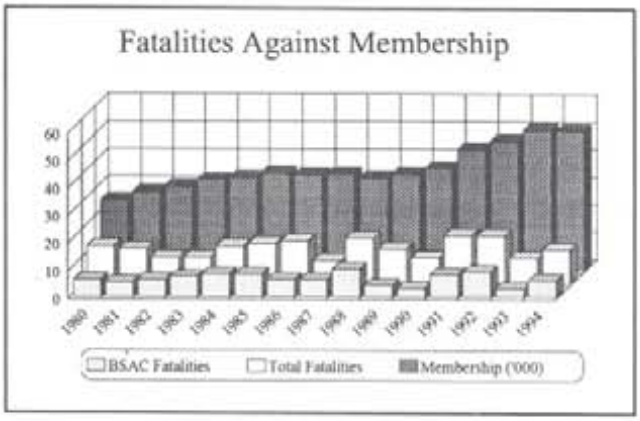


This year has seen 12 fatalities (in 11 incidents), and as I've already mentioned, 6 of these involved BSAC members. Most of these were easily avoidable incidents and occurred due to divers not following 'safe diving practices', carrying out inadequate dive planning or diving solo. This slide shows a breakdown of when in the year those fatalities occurred.

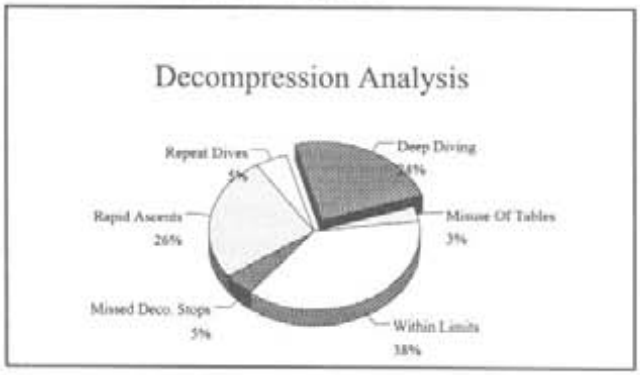
Particularly disturbing was an incident where a Novice Diver drowned in a cave at Hodge Close, after running out of air. The pair of divers had planned to dive to 30 plus metres and then to 'poke their heads in the entrance to the cave' at 24 metres. During the dive they decided to change their plan and made a deeper penetration of the cave system. After turning around at the end of the cave they both started to make their exit. When the dive leader reached the entrance the Novice Diver could not be found and the dive leader had insufficient air left to carry out a search. The Novice Diver was later found pinned to the roof of a central cavern with his BCD inflated and no air left in his cylinder. Had he been in open water there is a good chance he would have lived through the experience. A dive with no clear surface available is a risky undertaking at the best of times, certainly not the type of dive on which to take an inexperienced diver.

The Novice Diver concerned was, as it happened, fairly experienced but it still has to be said that their dive plan involved taking a Novice Diver to deeper than the recommended depth limits and did not include penetrating the cave to the depth that they did.

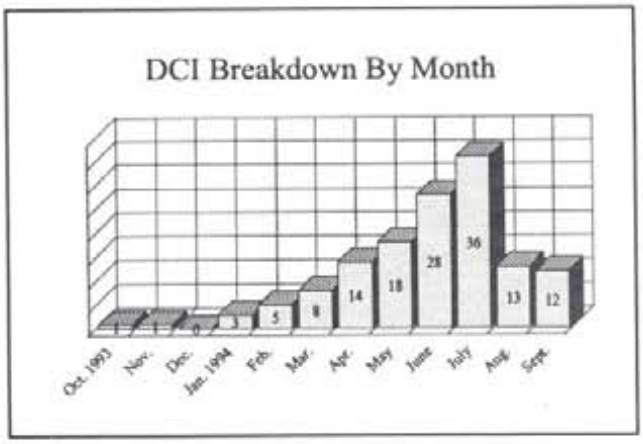
A further fatality occurred when two experienced divers were diving a submarine off the North East coast of England. On reaching the wreck one of the divers decided to abort the dive, the other decided to continue the dive on his own. The diver who aborted the dive reached the surface safely, the other was found later by other divers in the party. He had become trapped in line quite close to the shot. Alone and unable to free himself he had simply drowned after running out of air. The morale is strikingly clear and doesn't need me to repeat it here.



When comparing fatalities against club membership (in thousands) you can see that while membership has stayed fairly static this year, at 50,505 as at the end of October, the number of BSAC fatalities has increased from last years 3 to 6. While this is a doubling of last years figures it is important to realise that while still higher than the ideal zero fatality rate the rate of fatalities is extremely low.



We have recorded 149 incidents of decompression illness (DCI) this year, compared to 101 in 1993. The pattern of decompression incidents has changed little since last year, with a large peak in June and July. This year, however, that peak is exaggerated. Both by the fact that we have had more incidents, and also by the bad weather in April & May - which has had the effect of keeping figures lower than normal in those months - consequently increasing the angle of the slope up to the July peak.



If we analyse those reports for which we have details we can categorise them by the prime cause of the incident. As you are able to see from this slide, depth continues to be a major contributory factor in cases of decompression illness, and the trend towards deeper diving continues unabated. Misuse of tables is the lowest at 3%, followed closely by Repeat Dives and Missed Decompression Stops at 5% each.

It surprises me that rapid ascents account for such a large percentage of decompression incidents this year, with 26% being allocated to this particular category in 1994. This compares to the 16% in both 1992 and 1993. With those figures again being very similar despite the difference in physical numbers of DCI cases the 10% jump this year becomes more interesting.

One category that has remained stubbornly persistent is the number of incidents that occur within the limits of either table or computer. In 1992 the figure was 39%, 1993 was 36% and this year the figure is 38%. Close enough statistically to be put down as static. I'll come back to this area in a minute.

Once again, keeping more detail on the database has allowed me to carry out some further 'trend' analysis, some of which will not surprise you.

I mentioned a few minutes ago that over 38% of incidents occur within the table or computer algorithms - i.e. as far as the algorithm is concerned they were legal dives. This figure has stayed remarkably consistent over the last ten years and, to be quite frank, I do not know why. It is certainly true that 30% of these legal dives are carried out by divers who may have a Patent Foramen Ovale, many have been proved not to be suffering from the condition at all. It is also possible that, due to the peak occurring in the main holiday season, many of these may be due to divers carrying out multiple dives during a week's trip, or may simply be exhausted or dehydrated after a week on a rolling dive boat.

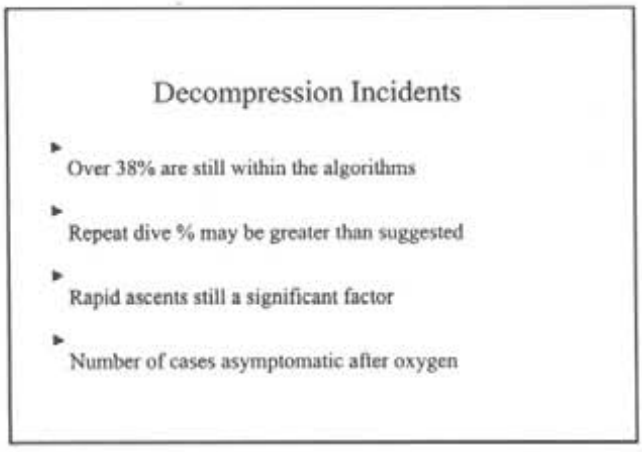
Given the backing and assistance of the British Hyperbaric Association and the Institute of Naval Medicine, and I have to admit that I haven't asked them yet, I will try to carry out more research into this area for next year's Diving Officer's Conference.

When you look at the increase in the percentage of rapid ascents this year it is my belief that this large fluctuation, when compared to previous years, could also be due to weather factors, warmer weather tempting the less experienced diver into the water more often. You must be aware that it is easy to read either too much or too little into these figures but with the other statistics I have highlighted this morning we are beginning to draw up a broader picture of this year's activity.

One of the good things that the reports have highlighted has been the effects of Oxygen Administration training - pioneered in sports diving by the BSAC. With the vast number of BSAC divers trained to administer oxygen in cases of diver injury it is not surprising to see that a significant number of divers suffering symptoms of DCI have been given 100% oxygen immediately those symptoms have been noted. Of these a large number have been totally asymptomatic by the time they have reached a recompression facility.

The importance of carrying oxygen, and being trained to use it, cannot be over emphasised. We must push for all commercial dive boat operators, hiring their facilities to sports divers, to not only carry medical oxygen but to be trained in its administration.

This year has also seen Nitrox divers involved in decompression incidents, others involving divers using oxygen as a decompression gas and has also seen a female Trimix diver suffering serious neurological DCI, the symptoms of which were not completely resolved. Despite the incomplete resolution of symptoms the diver apparently continued to carry out deep dives - diving to 93 metres just weeks after the initial incident.



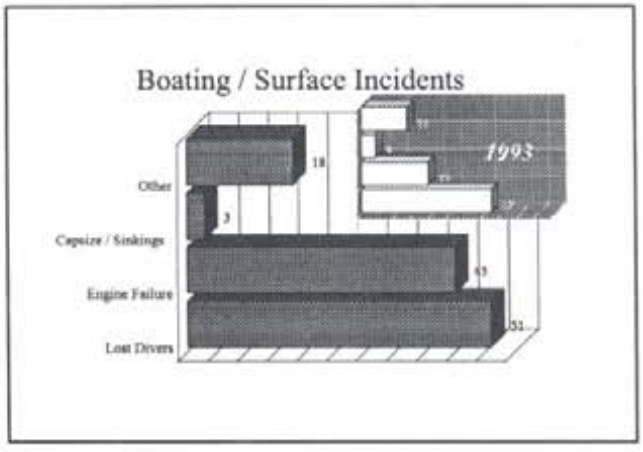


Fig 11

In 1994 we managed to record 112 surface & boating incidents. I say the words 'managed' with care because the number of BSAC incident reports received for this area is very low, and without the Coastguard's kind assistance we would be unable to highlight this dramatic and potentially dangerous increase in incidents. Of those 112 incidents, 51 were searches for missing divers - a dramatic and unwelcome increase over 1993 figures, shown on the inset graph in the top right. Each of these usually results in RNLI and SAR helicopter launches to carry out thorough searches. It is frustrating to discover that more than a few of these were false alarms following separation underwater - resulting in one diver surfacing and the other continuing his / her dive alone, totally against any training, advice or plain common sense.

The 'missing diver' incident that particularly stood out in 1994 involved the 3 divers who were flung from their 5m RIB returning from a dive in Lyme Bay. Their 'mis-adventure' was published in the press over several days, with local papers printing fanciful stories about the event for weeks afterwards. The fact that they had not followed standard procedure and notified the Coastguard of their passage details and dive site meant that they were not missed until their wives raised the alarm. This was not done until after 'closing time', by which time the divers had already been in the water for some 8 hours. It was also too dark at that time to mount a realistic search. Do remember to notify somebody of your intentions - preferably the Coastguard - then, if the unthinkable happens to you, the emergency services have a decent chance of helping you to safety.

Another statistic of note is the number of engine failures that have occurred to diver's outboard engines - 45 occurrences this year that required Coastguard assistance. These don't, as you may think, all occur at the beginning of the season, although many do, but throughout the whole year. Again, the number of these incidents may have increased as divers took to sea in boats that they may not have dared to had the weather been more typical.

As divers we need to ensure that our dive boats are as well, or better, maintained than our diving equipment, there are, after all, more people relying upon its safe operation. We need to record the number of hours the engine is run for, and then have the engine serviced according to the manufacturer's recommendations. If it does not clock up enough hours during the year then it must be serviced at least every 12 months.

After the engine is serviced, we also need to ensure that we test it before taking on a long sea passage. Several breakdowns have occurred immediately following an engine service carried out by qualified manufacturer's representative. Some of the maintenance our engines and boats require can be carried out at home on a D I Y basis. An article on this very subject was published in Diver magazine in December 1994, make sure that its advice is followed and ensure our engine's reliability.

Lost divers continue to be a growing problem. However it is becoming obvious that many of these incidents are due to the selfishness or just plain stupidity of the diver concerned. When you go back to your branches please ensure that you pass on this advice;

- plan to surface within a minute or two of separation, and follow that plan on every occasion,
- if one aborts, both abort
- carry SMB's on all drift dives and delayed SMB's on all other dives - ensuring maximum visibility should they lose the shot or have a lot of stops to do.
- consider carrying personal EPIRBs - they are on sale reasonably cheaply and enable you to be found very quickly
- make sure that an experienced diver cox'n is in the boat at all times, this means someone who knows what to do if a diver is overdue or missing, where to search, how to contact the coastguard etc. etc.
- and finally carry a recall signal and a VHF - for the time when, despite all the preparation and precautions, it still all falls to pieces - and sooner or later it will.

The BSAC, with assistance from the Coastguard Agency, will be addressing the issue of 'Lost Divers' in 1995, with the goal of reducing the number of occurrences considerably. Any advice and information resulting from this initiative will be published as quickly as possible. In the meantime if any of you have any constructive ideas please let me know about them, either over the weekend or by writing to me care of Headquarters.

Those of you who remember my presentation in 1992 will probably remember seeing this slide before. I make no excuses for showing it again because diving is a sport in which we need to use our grey matter. As experienced divers, Diving Officers and Instructors we should know when things are being done incorrectly and be able to identify potential incidents. Most of the incidents published in the 1994 Incident Report have a moral to tell. Please read the copy you have been given and, if necessary get some more copies for other branch members, it is available free of charge from BSAC Headquarters. Read the incident narratives -could a similar incident happen in your branch next season?

Thank you for your attention."