ARTICLES OF INTEREST REPRINTED FROM OTHER JOURNALS

HOW EXPERIENCED DIVERS REALLY DIVE

Bob Halstead

Introduction

I love diving, you could say I am fanatical about it. Which is why, 15 years ago, I gave up a good secure job teaching physics to start up a dive school and run dive tours. This has enabled me to make a lot of dives. They are not logged, but if I had to make an estimate, probably over 6,000. Diving is as personal and glorious to me as sex, and would be degraded if I felt I had to write about it after every session. So I do not log my sex life, and I do not log my dive life.

Taking students and tourists diving has also enabled me to see a lot of other people dive and I have observed all degrees of success and enjoyment from euphoria to despair. Estimating again, I have probably supervised over 100,000 dives. All this time I have tried to find ways of reducing the despair and increasing the euphoria for the divers in my charge.

One of the things I have learned is that the way that successful experienced divers really dive often differs from the way that safety nuts say they should dive. I define a “safety nut” as anyone who believes that rules are more important than thinking. Unfortunately, in this life, there are many people who just love to tell you what you should be doing.

Anyone would suppose that the rules for safe diving were inscribed in some Deep Sea Scrolls, true for eternity, instead of being a code of practice constantly evolving in the light of research and experience. It is obvious to me that divers who are at home in, and in harmony with, the sea, and who have contemplated their experience then studied and practised to perfect their skills, will be able to make dives that others less able would find dangerous. At the same time these divers can recognize when the conditions are such that even their abilities are insufficient to make a dive safe, and they will not dive.

Much research is now taking place trying to discover what causes diving accidents. On reading these reports I realized with some shock that they were being analyzed with reference to what the authors imagined was the way the divers should dive which is not the way experienced divers actually are diving. For example, if an analysis showed that 20% of the fatalities in a given year were of solo divers, authors who assume that the norm is “never dive alone” would argue that this demonstrates how dangerous solo diving is, and how important it is to dive with a buddy. Of course if 20% of all dives were in fact solo dives what the analysis would logically show is that diving solo or with a buddy does not affect diving safety. I could not find any study of how experienced divers actually dived so decided to make a survey to see if I could find out. This article is about the results of that survey.

The survey

Over a period of one year I asked our guests aboard Telita to complete, anonymously, a survey form. I also sent survey forms to our past guests and divers on our mailing list. Finally, survey forms were distributed to Australian NAUI instructors. In all 650 forms were distributed and 283 (44%) were completed and returned. We deliberately market Telita to experienced divers, nevertheless 18 of the responses were by divers who had made less than 100 dives. These 18 responses were not used in any further analysis leaving a sample of 265 (41% of forms sent out). Some divers failed to respond to certain sections which is why the percentages do not always total 100. Percentages have been rounded off to the nearest whole number. The tables below give the actual numbers and the percentages.

The results

1 AGE

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 years or less</td>
<td>23</td>
<td>9%</td>
</tr>
<tr>
<td>31 - 40</td>
<td>80</td>
<td>30%</td>
</tr>
<tr>
<td>41 - 50</td>
<td>77</td>
<td>29%</td>
</tr>
<tr>
<td>51 years and over</td>
<td>85</td>
<td>32%</td>
</tr>
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</table>

2 SEX

<table>
<thead>
<tr>
<th>Gender</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>181</td>
<td>68%</td>
</tr>
<tr>
<td>Female</td>
<td>83</td>
<td>31%</td>
</tr>
</tbody>
</table>

3 NUMBER OF YEARS OF DIVING

<table>
<thead>
<tr>
<th>Year Range</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 10</td>
<td>93</td>
<td>34%</td>
</tr>
<tr>
<td>10 or more</td>
<td>265</td>
<td>65%</td>
</tr>
</tbody>
</table>

4 CERTIFICATION

<table>
<thead>
<tr>
<th>Certification</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic or Openwater</td>
<td>114</td>
<td>43%</td>
</tr>
<tr>
<td>Higher</td>
<td>80</td>
<td>30%</td>
</tr>
<tr>
<td>Instructor</td>
<td>66</td>
<td>25%</td>
</tr>
</tbody>
</table>

5 NUMBER OF DIVES

<table>
<thead>
<tr>
<th>Dives Range</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 - 499</td>
<td>112</td>
<td>42%</td>
</tr>
<tr>
<td>500 or more</td>
<td>151</td>
<td>57%</td>
</tr>
<tr>
<td>Total dives</td>
<td>234,631</td>
<td></td>
</tr>
<tr>
<td>Average number of dives</td>
<td>885</td>
<td></td>
</tr>
</tbody>
</table>

6 LOG BOOK

<table>
<thead>
<tr>
<th>Log Books</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log dives</td>
<td>143</td>
<td>54%</td>
</tr>
<tr>
<td>Do not log dives</td>
<td>101</td>
<td>38%</td>
</tr>
</tbody>
</table>
7 DEEPEST DEPTH
39 m or shallower 29 11%
39 - 60 m 170 64%
Deeper than 60 m 61 23%

8 DECOMPRESSION DIVE
Have made a decompression dive 207 78%
Never made a decompression dive 53 20%

9 DECOMPRESSION SICKNESS
Have had decompression sickness 18 7%
No decompression sickness 241 91%

10 REGULATOR FAILURE
Failure with no air underwater 56 21%
Never had regulator failure 204 77%

11 EMERGENCY ASCENT BECAUSE THEY HAD NO AIR
Had to make emergency ascent 95 36%
Never made emergency ascent 164 62%

12 METHOD USED IN EMERGENCY ASCENT
Some divers have made several emergency ascents.
Total number of emergency ascents 173
Emergency swimming ascent 92 53%
Buoyant ascent 16 9%
Buddy Breathing 31 18%
Octopus ascent 31 18%
Spare air or pony bottle 3 2%

13 EMERGENCY ASCENT BECAUSE BUDDY HAD NO AIR
Had to make emergency ascent 93 34%
Never made an emergency ascent 176 67%

14 METHOD USED IN BUDDY EMERGENCY ASCENT
Total number of emergency ascents 190
Buddy Breathing 89 47%
Octopus ascent 101 53%

15 BUDDY DIVING
Always dives with a buddy 69 26%
Mostly dives with a buddy 109 41%
Sometimes dives with a buddy 50 19%
Rarely dives with a buddy 29 11%
Never dives with a buddy 5 2%

17 SKILLS PRACTICE
In the past year have you practiced:

i Equipment removal and replacement underwater.
   Yes 109 41%
   No 154 58%

ii Buddy contact
   Within touching distance 19 10%
   Within vision 161 86%

iii Exits
   Always exit together 67 36%
   Sometimes exit separately 116 62%

iv Buddy’s air supply
   Check your buddy’s air 65 35%
   Wait for buddy’s signal 108 58%

18 USE OF “SPARE AIR” OR PONY BOTTLE
Usually take on dive 29 11%
Do not use 228 86%

19 USE OF DIVING COMPUTER
Use diving computer 215 81%
Do not use diving computer 42 16%

20 BREATH-HOLD DIVING ABILITY
Dive to less than 9 m. 113 42%
Dive 9 m or deeper. 148 56%

21 UNDERWATER PHOTOGRAPHERS
Take underwater photos or video 191 72%
Are not underwater photographers 72 27%

22 BUOYANCY COMPENSATOR FAILURE UNDERWATER
Have experienced sudden failure 74 28%
Never had failure 188 71%

Comments
Here is where I show that the statistics prove all of my outrageous ideas about diving. Well, actually no. Statistical arguments seem to follow Newton’s Third Law: “For every argument there is an equal and opposite reply”, so my observations will be modest. I claim to be a diver not a
scientist. Whatever minor liberties, if any, I have taken with the analysis, the figures are just as I found them.

The experienced diver

The typical experienced diver surveyed is older, 61% were older than 40 years, has dived for 10 or more years (65%), has made a lot of dives (average 885 each), and is still diving (the survey was of active divers). One third are women (31%). Our experienced divers do not necessarily have good diving qualifications, only 25% of our sample were instructors, and this is only because the survey included Australian NAUI Instructors rather than being confined to Telita clients.

Each diver surveyed was asked the number of dives that they had made. Many were able to give precise figures from their log books (54%), some gave estimates. The survey was anonymous so that there was no motivation for over estimating. Wherever an estimate involved two figures e.g., 6-700, I always used the smaller figure. Several put “hundreds” or “thousands” which I always interpreted as 100 or 1,000. I am confident that the figures are a real indication of the number of dives experienced divers, some of whom are professionals, have made.

Deep and decompression diving

Only 11% have stayed shallower than the standard recreational limit of 39 m, and 23% have dived deeper than 60 m. 78% have made decompression dives, and 7% have had decompression illness. (Some divers mentioned minor symptoms that resolved without treatment and were not even certain they had been bent). Sixty six per cent of those reporting DCI had never dived deeper than 60 m.

If the 18 divers who had DCI had only been bent once each (I did not ask that question, although some made it clear that only one incident was involved, and no one volunteered that they had been bent more than once), the incident rate works out at less than 0.01%. It was one bend for every 13,035 dives, or 0.0077%.

Our profile of the experienced diver shows that they have typically dived deeper than 39 m and have made decompression dives, yet probably have a bends rate that is less than the average commonly reported for all sport divers. Most (81%) are now using diving computers to monitor their dives.

Equipment failures

Twenty one per cent have had a regulator fail underwater giving no air, and 28% have had a buoyancy compensator (BC) suddenly fail underwater either by leaking or continuously inflating. These are significant percentages and it is obvious that the possibility of equipment failure cannot be ignored. A common response to this is to say that divers should get their gear properly serviced regularly, and of course I agree. However I am always being asked to fix client’s gear that is new, or that has just been, so they thought, properly serviced.

I believe that every diver should be trained to survive a situation which results from regulator or BC failure.

Emergency ascents

Thirty six per cent have had to make a total of 173 emergency ascents because they had no air underwater (regulator failure or ran out of air) and 34% have had to make a total of 190 emergency ascents “because their buddy had no air”. Our experienced divers were more likely to have to make an emergency ascent because of their buddies problems than their own. The most popular method by far, for those that found themselves in trouble, was the Emergency Swimming Ascent, 53%, against 18% each for buddy breathing and octopus breathing. A low percentage of divers used “Spare Air” or other pony bottle systems (11%).

Our divers did not use a buddy assisted method often as 64% used an independent method to reach the surface rather than have their buddies help them with an assisted emergency ascent. It is worth noting that less than half had practiced buddy breathing (40%) or octopus breathing (46%) in the past year.

The figures do not surprise me at all. What surprises me is the fact that many divers automatically assume that having a buddy is safer. In fact a buddy may make the dive safer or may add to the risk of a dive. Some have been saved by their buddy. Unfortunately those who have perished because of their buddy are not around to testify. However 34% of our divers were put at risk having to make a total of 190 emergency ascents because of their buddies.

The obvious answer, as far as safety is concerned, is to have a foolproof, independent method of getting to the surface if you have no air, and to make sure that your buddy has one as well.

Buddy diving

Only 26% followed the golden rule of “always dive with a buddy” and, while a further 41% mostly dived with a buddy, some complained that the reason is that they were not allowed by dive boats to dive alone, even if they wanted to.

The next four questions were designed to see if those always or mostly diving with a buddy (the others were not
recently certified divers, until at least 50 dives are logged. After 50 dives in varying conditions a diver may be considered properly certified and after a further 50 logged dives could be classed as experienced. At this stage logging dives would then become voluntary. I would put a time limit of two years for completing the 50 dives. This would mean that the probationary certification lapses if the 50 dives are not completed on time and retraining becomes necessary. This probationary period would emphasise the vital importance of experience for safe scuba diving.

The above first appeared in the Telita Newsletter and is reprinted with permission.

Bob Halstead’s address is Telita Cruises, P.O.Box 303, Alotau, Papua New Guinea.

REGULATORS V THE MACHINE

In August 1989 DIVER carried the results obtained when 40 regulators, commonly available in Britain, were subjected to performance tests on a breathing machine. As was explained at that time, the type of test that was used formed the basis of an intended European standard. Response from divers to the results of the survey were very positive and enthusiastic. Response from the regulator manufacturers/distributors was coloured by whether or not their particular regulators had fared well in the tests!

DIVER has now repeated the survey on a comprehensive range of regulators currently on offer, no fewer than 52 models.

Key to table on opposite page

A = Adjustable; Adp = Adaptor; A/B = Adjustable Venturi; B = Balanced; B/D = Balanced Diaphragm; B/P = Balanced Piston; C/W = Cold Water design; D = Diaphragm; E/S = Environmentally Sealed; I/C = Integral Cover/Purge; I/P = Integral Purge; I/P Tur = Low Pressure Turret; P = Piston; S = Swivel; S/C = Swivel Connector; S/D = Side Diaphragm; Se = Servo; T/a = Turbo Assist; T/C = Teflon Coatings; VAD = Venturi Assisted Design.

* As a result of these tests, Oceanic have discovered a quality control problem which has resulted in some Omega regulators failing to reach the figures shown. Oceanic will be making a public announcement shortly.