

Opinion

A personal overview of accidents and risk management in the recreational diving industry

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Key words

Accidents, diving accidents, recreational diving, medical conditions and problems, risk management, legal and insurance

Abstract

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Recently the recreational diving industry has experienced an increase in accidents and fatalities (per capita, based on reliable estimates of diver populations). Many of these incidents have resulted from a degradation of training standards for 'performance-based' learning of skills and knowledge, both for students and the instructors, dive masters, and assistants who are responsible for their initial training and subsequent courses aimed at 'advanced' curricula. The industry has also seen a decline in the experience and practical expertise of diving leadership staff responsible for the management of resorts and liveboard diving operations. The resulting incidents have led to a rise in legal actions and settlement costs or trial verdicts. The important contributing issues in accident causation are discussed. A fundamental lack of understanding of how to effectively use the tools of risk management (waivers and releases, defensive teaching, good record keeping), as well as inadequate pre-training screening that might eliminate some participants based on age, physical condition, or pre-existing medical issues, are contributing to this increase. These factors also complicate the efficient management of litigation through the courts. The costs associated with litigation are now causing increased insurance premiums, reduced scope of coverage for some activities, and outright denial to some seeking insurance. This paper provides a personal perspective based on a 40-year involvement in all aspects of the diving industry and extensive experience in the litigation process as a consultant and expert witness.

Introduction

Obviously our goal is to identify and recognise the precipitating events that cause diving accidents so they can be prevented and reduced. It is important to understand and address these issues from an actual body of expertise in the formulation of standards and training, field operational protocols, and insight into the litigation arena. It is impossible to accurately assess incident rates and underlying causation factors solely from public accident records or simple statistics. The author provides a personal perspective on causation issues, suggestions for improvements, and an explanation of risk management in layperson's language based on his 40-year involvement in all aspects of the diving industry as well as ongoing direct involvement in the legal and litigation process as an 'insider' with direct knowledge of facts in more than 235 case files.

Elemental issues of accident causation

- Some scuba training agency programmes lead divers to believe they are more qualified than they are, with ratings like 'Advanced Diver' being achieved with as few as 9–10 total dives and 'Master Diver' with fewer than 50, and 'rescue' courses that are so simplistic as to be largely impractical in actual emergencies, etc.
- Divers can qualify for instructor ratings with as few as 50 dives in some agencies.
- No effective oversight is made within some agencies to interdict and restrict those instructors with repeated standards breaches and accident records.
- Courses tend to be abbreviated for the sake of moving the student through the system instead of ensuring that skills and knowledge are fully learned and mastered. One agency claimed to use a performance-based standard of qualification, but in the discovery disclosures of one lawsuit that premise was proved to be totally misstated. For example, if a student tried two dozen times to clear their mask and finally got it right on the 24th time, they were 'passed' in spite of the fact that this clearly did not demonstrate the 'mastery' and 'repeatability' of the skill; only that the student had successfully cleared their mask once! This hardly meets a standard wherein the skill can be repeated as needed with competence and confidence.
- Students need the opportunity to make mistakes under direct supervision and then have them corrected by the observing instructor who turns the process into a positive learning experience instead of into a lesson in survival when it occurs in the field with no outside help.
- The number of divers entering the sport has historically been vastly overstated for marketing purposes. Diving Equipment & Manufacturing Association (DEMA) census reporting in recent years has confirmed this.¹ When the database of divers is not accurate, it skews the ratio of participants' accident incident rates and makes

forecasting risk predictability and actuarial insurance ratings impossible to determine and assess.

- The drop-out rate for divers and instructors is at an historic high. This is particularly important for instructor and other 'leadership' level ratings, as existing 'professionals' tend to be replaced with those even less qualified. This is mostly due to employment conditions and lack of financial compensation. Although touted as a career path by many agencies, the majority of those entering instructor roles find that they lack the means to earn a living wage unless their ratings are supplemented with legitimate extra credentials such as EMS training, maritime licenses, or specific expertise in such fields as photographic training to supplement their value in a retail, resort, or liveaboard position.
- With the decline in diving participation in the last decade, there has been a corresponding decline in experienced mentors for new instructors and dive masters for on-the-job or in-the-field training in actual scenarios. This has contributed to accident rates and the failure of early identification of behaviour patterns that would have been more likely to be recognised as potentially dangerous by more experienced diving supervisors.
- As a general observation from a review of lawsuits and accident reporting, we are seeing more accidents resulting from a simple lack of common sense, maritime experience, etc, since little of such specific training and assessment is included in the curricula of many agencies.
- There is also a need for enhanced training in evacuation, field assessment and treatment, and perhaps, most importantly, disqualification of divers from some activities due to lack of experience before being allowed to engage in more challenging conditions. For example, the September 2009 issue of *Undercurrent* magazine reported the celebration of a diver's 25th logged dive aboard a liveaboard vessel at Cocos Island, a site notorious for the need for more advanced diving skills and the ability to dive independently.
- The role of the remaining (and rapidly shrinking) diving press in print media is not helping either. Just take a casual review of photos showing dangling gear, octopus emergency second stages dragging on the bottom, unsuitable equipment, over-weighted divers, etc.
- The tragic record of diver-error rebreather accidents/fatalities, expedition trips led by less than qualified leaders with associated fatalities, lack of pre-qualification protocols, failure to provide a designated, overall, qualified supervisor on specialised-equipment, deep, or penetration dive programmes is rampant.
- Finally, while most training agencies do a creditable job of developing worthy standards and procedures for training, many resorts and liveaboard ship operations lack even rudimentary operations manuals that address field-condition protocols for more advanced medical assessment, search and rescue, adequate evacuation methods, or even sufficient supplies of oxygen with demand masks for surface-breathing first aid.

So you want to climb Mount Everest?

Many divers who emerge from initial diving certification programmes with an 'open water' certification choose not to pursue further formal training, going forward by acquiring practical experience through their diving activities. Often this works well, since practical, real-life experience arguably is just as relevant in producing a qualified diver... at least, for warm waters, and not too difficult conditions. While certification agencies would now prefer that divers progress at least partly through an enhanced system of ratings, there is no requirement that they actually do so.

Many travelling divers are now 50 years or older. With age and prosperity also come limitations that should be recognised as serious considerations. The 50-year-old plus diver has to take into account the realities of aging that include reduced stamina, possible high blood pressure, cardiac problems, reduced flexibility and mobility, arthritic joints, vision and hearing loss, deteriorating muscular strength, postoperative limitations, side effects of required medications, and general reduced physical fitness. Of course, there are exceptions to such broad-based generalities, but within the general population that I am identifying, possible limitations exist that can affect their fitness to dive. Older divers may be perfectly fine with their original training and the life experience they have acquired through continuing dive participation, provided they recognize their limitations and restrict their diving to suitable environments and situations. However, if they want to indulge in more rigorous or technically challenging diving activities, then seeking out the proper training before jumping off to dive the *Andrea Doria* would generally be a pretty good idea.

Herein lies a problem that has increasingly raised its ugly head. I call it the '*into thin air*' mentality. This references the account of the multiple fatal tragedies on Mount Everest in 1996, as chronicled in Jon Krakauer's infamous and revealing book.² The lesson from that tragic year was that there were a lot of amateur climbers on the mountain who should not have been there, but they had the financial resources to pay the hefty expedition fees and figured the alpine guides would look after them in spite of any limitations they might have. One woman climber even paid extra to be 'short-rope'd' to the summit, a practice wherein she had a Sherpa essentially drag her up the face of Everest on a tether. When a series of unexpected weather conditions occurred, several amateur climbers died along with the professional guides who tried to save them.

In recent years, some of the same issues have arisen within the diving industry as well-intended, but perhaps under-qualified, folks have signed up for diving expeditions that turned out to be beyond their capabilities. Most operators have screening processes designed to determine the applicants' expertise in advance. Typically, this requires an application that details training, diving experience, medical history, fitness to dive, etc. This should work well, in theory.

The breakdown occurs when divers misrepresent their diving skills and/or medical fitness. This is tough for an operator to determine and, of course, there is the underlying element of wanting to procure a well-paying customer for these exotic trips. So, sometimes the screening process breaks down. Some divers get injured or die, while the lucky ones have close calls or were scared out their wits when the harsh reality of field conditions caught up with them and they were unable to cope.

Consider a few real-life examples that I have had to deal with in the last few years: a 58-year-old who did not feel it necessary to disclose that he had only one lung; a 46-year-old who was in such poor physical condition that she could not climb back aboard the dive launch without assistance (and this was with no equipment on!); a 64-year-old with a history of four cardiac events in the last two years; a 55-year-old who was sufficiently obese that he could not reach down to put on his own fins; a 52-year-old taking three antidepressant medications and with a recent history of suicide attempt and a 57-year-old in such poor shape he could not swim from the stern to the bow line of a 20-foot dive launch to reach the descent line. While the above citations are daunting, they were unknown to me or to my staff until we had to engage in rescues. Incredible? Yes. But the frequency of such misrepresentations is more than occasional; it is happening more and more and has caused many operators to adopt far more stringent screening and risk-management policies.

There are a great variety of focused advanced training programmes that can ease the diver into gaining the experience and expertise to participate in more challenging diving. While it is difficult to define really what an advanced diver might be, I think any modicum of common sense would suggest that fewer than 10–12 total experiences in any activity, quite apart from diving, would hardly meet any reasonable definition of 'advanced'. The ocean can be a very unforgiving place to play chicken in traffic. You can also risk the lives of fellow divers who may need to forsake their safety in attempting to rescue you.

Rebreathers are another example. By comparison, open circuit equipment is fairly simple and relatively foolproof. If you don't turn the valve on, the regulator will not work. In rebreathers, however, you can actually breathe through the closed or semi-closed loop without turning the gas supply on. There is no immediate warning that things are amiss until you pass out from hypoxia. A recent New Zealand fatality is a classic example. Rebreathers have demanding and unforgiving maintenance regimes as well as lengthy checklists and set-points before diving. If you are not willing to make a commitment to taking on the added responsibility that such equipment requires, then stay on open circuit.

Understanding risk management

Nothing in life is safe, and diving, like many other sports activities, is inherently dangerous. In fact, a lot of the diving

industry's risk-management protocols were liberally adapted from those of the snow-skiing business. As the popularity of other potentially dangerous sports became more widespread (think snowmobiling, ATVs, skateboard parks, skydiving, hang gliding, and even youth football and baseball leagues), the use of waivers and accompanying risk-management practices to warn participants in advance of hazards became routine.

LIABILITY INSURANCE

There are few buzzwords to come into the lexicon more important to professional diving instructors than 'risk management' in today's society of litigation. Luckily there are some relatively simple steps that instructors can take to help balance the odds in their favour. The obvious first step is to acquire professional instructor liability insurance. In addition to obtaining insurance, it is important for the diving professional to have a fundamental grip on the basic tenets of risk management in order to conduct themselves with all possible caution to protect their students, divers in their care, and themselves.

TEACHING DEFENSIVELY

Probably the single best advice an instructor can follow is to 'expect the unexpected'. In other words, never assume that anything will go right or as planned. Remember, the whole purpose of supervision is to give the student diver a chance to learn the skills of diving and, if mistakes are made, the instructor is right there to help turn those mistakes into positive learning experiences instead of grim survival tests. It is vital that instructors conduct all programmes in accordance with agency standards. These provide a proven curriculum of academic knowledge and practical skills that progress the student on the path of self-sufficiency and independent activity. Bear in mind that instructor/student ratios are based on site conditions. In situations that are suboptimal, such as reduced visibility, surf conditions and the presence of currents, especially if the class has students needing special attention, the number of students should be reduced and/or additional assistant instructors added to ensure proper direct supervision.

PROPER USE OF RECORDS AND WAIVERS

The proactive use of the arsenal of waiver and release forms available to the instructor or dive operators is vital to the successful conduct of their activities. These will generally include at least a medical history form and a general release of liability and assumption of risk agreement. No instructor, resort, or dive-vessel operator should conduct their activities without proper use of such documents. The whole idea of waivers and releases is to establish a contract between the student/diver and instructor/dive operator that stipulates certain understandings as to the nature of the activities about to take place in training. Sufficient time for contemplation and absence of threat of monetary loss are essential, as

these alone can be grounds to deny applicability. Asking a class of students or group of divers to sign waivers shortly before pool activities or open-water diving activities begin does not meet the spirit of the release. Execution of the waiver and release documents should be handled as one of the most important parts of the relationship with students or divers participating in post-certification activities. This is a formal contract that affects their legal rights and the rights of their families.

After initial certification, subsequent waivers require the diver to represent his diving experience and prior training. This is to clearly establish that the person executing the release has a body of life experience in the sport, separate from the specific warnings as to hazards and risks, on which he may base his decision to participate. For example, a person signing up for basic entry-level scuba really has no understanding of the inherent risks of the sport until his instructor covers that material in his class. On the other hand, a certified diver with six years of diving in a variety of conditions and depths since his original training already is aware of most of the standard hazards associated with scuba participation. He can make an informed decision based upon that experience and prior training.

TRAINING AND DIVING ACTIVITY RECORDS

Written evidence of a student's successful completion of tests, skills, pool and open water sessions is essential. Safeguard the student training record, medical history forms, physician's approval if necessary, as well as waiver documents. These files should be preserved for at least seven years. Obviously if an accident were to occur during training they would be of immediate use. They have additional importance if an accident were to occur after certification and a law suit was filed with allegations that the original course was lacking full content or that the student failed certain academic topics or skills without proper reinforcement or review to ensure the student's complete understanding or proper mastery of skills. Keeping paperwork up to date as the training programme or diving activities proceed and always reviewing any incorrect performance by a student or diver until it is properly completed or mitigated are further elements of safe practice.

MEDICAL HISTORY

Ensure that students complete the medical history form prior to any class activities, including academic lectures. It is recommended that instructors not coach students on completion of the form. However, it is appropriate to clarify any questions that may arise. Should a student accidentally respond to a question in error, a new form should be given to them to fill in with accurate answers. When a student indicates one of the areas that require a physician's medical approval, have the student provide the executed medical approval signed by a medical professional for proper documentation of the student record.

Conclusions

The diving industry is at a crucial crossroads of evolution at this time. Without some fundamental changes in paradigms as noted in the above narrative, there are very real negative consequences that will materialise and further limit growth and profits as accidents/fatalities escalate and the insurance market contracts. Increased litigation costs from unnecessary breaches of duty by those insured will only increase underwriters' reluctance to participate in this risk and eventually exit the market, or result in costs that may prove unaffordable. Lawsuits will only increase and the costs of defence, settlement, or verdict awards escalate to unacceptable levels. One thing is certain: litigation is recession-proof. Diving professionals should use the risk-management tools available and teach defensively; they can take that advice to the bank.

References

- 1 Diving Equipment & Manufacturing Association (DEMA). *Open water certification count*. Available at <http://www.dema.org/displaycommon.cfm?an=1&subarticlenbr=290> (last accessed 21 July 2010)
- 2 Krakauer J. *Into thin air*. New York: Anchor Books; 1999.

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Captain Bret Gilliam is a USCG Merchant Marine Master, professionally involved in the diving industry since 1971. His background includes scientific expeditions; military/commercial projects; operating hyperbaric diving treatment facilities, liveaboard dive vessels and luxury yachts; retail dive store and resort operation and ownership, and filming projects. He has published widely on diving-related subjects. He was the founder and President of the training agencies TDI and SDI, ex-Chairman of the NAUI Board, and ex-Vice President for IANTD. He has an extensive practice as a litigation consultant and expert witness in the fields of diving, maritime operations, and field management of diving barotraumas.

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Editor's note:

Having recently read, in an article in the magazine *Undercurrent*, Capt Gilliam's concerns regarding recreational diving accidents, I invited him to submit this article on the health and safety of sport divers. The opinions expressed are the author's own and are not necessarily those of the Editor, EUBS or SPUMS.