

Death at the End of a Hose

How one man's honest mistake cost another man his life, and grief for several companies.

BY STEVEN M. BARSKY

The following article is based on a real legal case. The names have been changed to protect the identities of the parties involved.

MOST COMMERCIAL DIVERS ARE AWARE of the dangers of carbon monoxide (CO) poisoning, particularly in regards to possibility of having CO pumped down the hose by an improperly configured compressor. However, in the fringe world of “professional diving,” somewhere between sport diving and hard-core commercial diving, lies a world of divers with widely varying degrees of training, expertise, and equipment. People we might characterize as professional divers would include scientific divers, public safety divers (law enforcement, fire), hull scrubbers, seafood divers, and golf ball recovery divers. While the training requirements for scientific divers are rigorous, training requirements for hull scrubbers, seafood divers, and golf ball recovery divers are non-existent.

Even though this case is not a commercial diving accident, what happened has important implications for diving equipment manufacturers and the commercial diving companies who use surface-supplied equipment.

A Tragic Accident

Several years ago, a man we'll call “Mike,” who owned a small golf ball recovery business in Florida, purchased a used floating “hookah” diving system. Mike had no formal diver training, other than an admonition from his uncle, who also recovered golf balls, to never hold his breath while underwater.

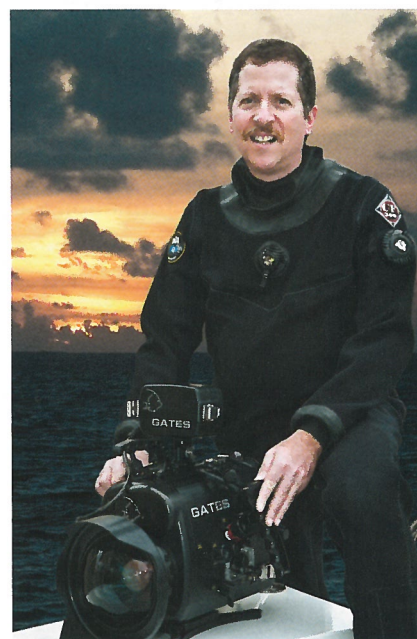
Hookah diving systems typically include an engine (usually gasoline driven), a compressor (diaphragm with no oil lubrication), a “snorkel” designed to provide a remote air intake to avoid CO ingestion, and a framework on which to mount the unit. Most hookah systems for golf ball recovery are mounted on an inner tube so the system can float and follow the diver. The systems are designed for shallow water, typically less than 20 feet deep. Many different companies “manufacture” hookah systems, although for the most part, they assemble systems from components manufactured by other vendors.

Note that the ADCI does not approve the use of hookah diving gear for commercial

diving operations. These systems typically do not produce a sufficient volume of air, don't produce adequate pressure, don't have a volume tank, lack filtration, and don't have the valves to meet the safety demands of commercial diving. Additionally, most hookah systems have no provision for a bail-out bottle without the addition of some type of aftermarket manifold block. OSHA also does not permit the use of hookah for commercial diving operations.

When the engine on Mike's hookah system died, he purchased a new one from a hardware store, without giving it too much thought. After all, all small engines are alike, aren't they? Unfortunately not, for although their footprint was identical, the engine exhaust on the new engine was located on the opposite side when compared to the prior engine used in the system. This placed the exhaust for the engine less than twelve inches away from the compressor intake.

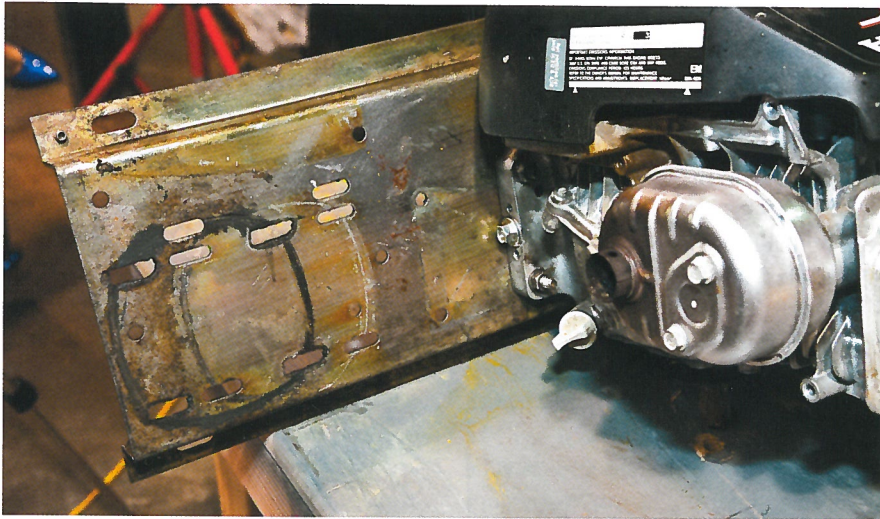
Mike had no appreciation of the reason for the compressor intake “snorkel” or how tall it should be to help avoid the



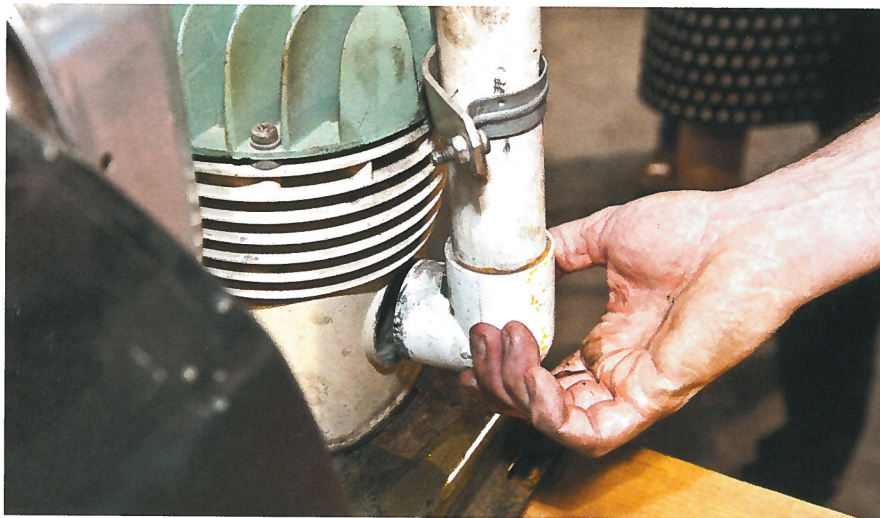
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compression of carbon monoxide along with the diver's breathing air. The snorkel on his compressor was missing an extension piece, which he may not have even realized needed to be there. In addition, Mike had never bothered to have the air from the compressor tested for purity.

Mike loaned the compressor to “Tom,” a newly certified sport diver who was working for him as an “independent contractor.” Tom had no experience diving with hookah gear or in diving in the black water found



Once the compressor was removed from the frame, it became apparent that the compressor had been moved from its original location and that someone had hand cut new mounting holes for the bolts that secured the compressor. Note the irregular slots in the frame and the outline of the compressor base ringed in oil, as well as the previous location of the compressor.



The connection between the snorkel and the compressor was not secure, which would allow carbon monoxide to freely enter the compressor.

in golf ball water hazards. Unbeknownst to Mike, Tom was also using prescription anti-depressants without a prescription, had been institutionalized for mental instability, and had a history of unexplained blackouts.

Mike also loaned Tom a pair of what he called “golf ball pants,” which he had designed to be worn like a giant diaper over the diver’s other gear. The golf ball pants were made to hold the golf balls collected by the diver, but without a quick release or other mechanism for ditching the golf balls in the event of an emergency. The golf ball pants were recovered almost a year after the body had been recovered. They still contained hundreds of golf balls, which would have

added to the weight of the diver, adding to the probability he was overweighted for the type of dive he was performing.

On his first day of diving with the system Tom called Mike and complained of a headache and nausea, but attributed this to drinking too many caffeine laced energy drinks. Neither man associated this with the possibility that the air that the compressor was producing was contaminated with carbon monoxide.

When Tom failed to return home from work the next day, his wife called Mike and asked him where he was. Mike drove to the golf course where Tom had been working and found the police and fire department

recovering Tom’s body from the golf course water hazard where he had been working. The engine on the hookah unit had run out of gas, and Tom was found dead on the bottom of the pond in eight feet of water.

The Lawsuit

Shortly following Tom’s death, his widow filed a lawsuit against Mike, as well as all of the companies who manufactured the components for the hookah system. This included the engine manufacturer, the compressor manufacturer, the company who the widow’s attorneys believed assembled the hookah system, as well as another company who also manufactures hookah systems (since they weren’t sure exactly which company assembled the hookah system in question).

The basis for the widow’s suit against the company who was alleged to have originally manufactured the hookah system was that a low volume surge tank used downstream of the compressor was stamped with the company’s name. The surge tank was downstream of the diver’s hose and had no direct contact with the compressor package itself.

During the course of the lawsuit, experts from both sides of the case disassembled the hookah system. Upon disassembly it was discovered that the frame the system was mounted on had numerous holes in it that appeared to have been cut with a hand saw. These hand cut holes were obviously used to change the mounting location of the compressor, since the outline of the previous compressor location could be seen on the frame once the system was taken apart. It also became apparent that in addition to having the wrong type of engine and an insufficient length compressor intake,



The hookah diving system that was provided by the golf ball diving company to the diver who died.

i.e. “snorkel,” the connection between the snorkel and the compressor was not secure, allowing carbon monoxide to freely enter the compressor.

The plaintiffs made numerous allegations against the company who they thought assembled the system, including inadequate engineering and testing, insufficient warnings on the system, and that manuals provided with the compressor system did not meet current standards.

The plaintiff’s engineering experts had no diving background and failed to test the output of the compressor at the end of the diving hose. Consequently, the plaintiffs never proved whether the compressor was actually pumping an unacceptably high level of carbon monoxide to the diver.

During the course of the trial, the toxicologist for the defense testified that the level of carbon monoxide in the deceased’s body was not sufficient to cause unconsciousness.



A properly configured hookah diving system looks like this. Note the tall white air intake or “snorkel” used to provide air to the compressor. This type of system is not considered acceptable for commercial diving under ADCI standards.

Whether it was sufficient to cause him to be impaired and have a reduced respiratory capacity to deal with being overweighted was never discussed. It was the defense’s contention that the hookah system simply ran out of gas and Tom panicked, probably removing the golf ball pants, but failing to ditch his weights before passing out. Dealing with these issues in black water was something for which Tom had never been trained.

The trial lasted for just under two weeks and the jury came back with a 100% “defense verdict,” i.e., no liability on the part of the manufacturers. The golf ball diving company settled their liability for an undisclosed sum.

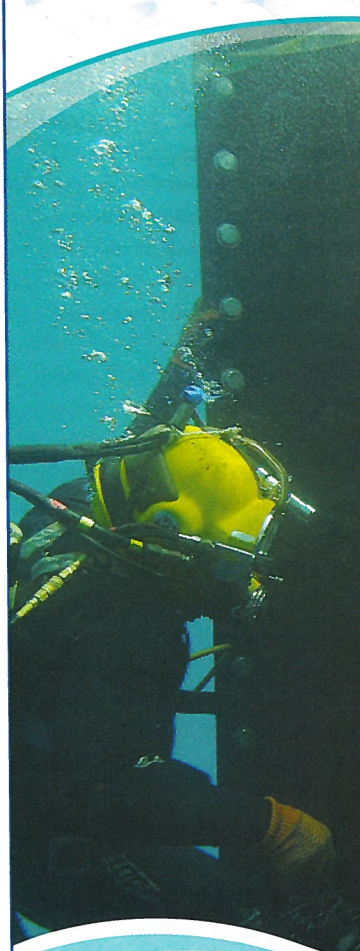
Lessons Learned

There are a number of lessons that are important to both manufacturers and diving companies that can be learned from this case. Although the manufacturers got a complete defense verdict, they still lost untold hours from their business and the worry that goes with having to wonder what the outcome of the suit might be while it was in progress.

Recommendations for Manufacturers

- Mark your products as yours.
This case would have been much simpler had all of the manufacturers involved adequately marked their products (and major components) to identify what they had manufactured and what they had not. In addition, every product you sell should carry a serial number that should be recorded before the product leaves the factory (including the date of manufacture and who it was originally sold to).

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Divining Companies Have their own Set of Responsibilities

Divining companies also have a responsibility to their employees when it comes to equipment. Although these duties should be clear to any commercial diving firm, they bear repeating here.

- Make sure your divers are trained for any gear they use. This includes the simplest items, such as air compressors, to more dangerous pieces of gear, like high-pressure water blasters.
- Make sure all of your maintenance and testing logs are up to date.

Don't fall down on this important part of record keeping.

- Make sure your maintenance is performed by trained technicians using the right tools. Don't scrimp on the training for your technicians and never buy third party parts rather than the genuine parts offered by the manufacturer. Anything else is false economy.
- Never make changes to your equipment that is not authorized by the manufacturer. If your company makes modifications to any piece of equipment, then your company will shoulder the responsibility for that piece of gear.

Being accused of manufacturing a defective product is bad enough, but being accused of manufacturing something that you had no hand in fabricating just might be worse. Manufacturers can help protect themselves by taking the time to identify their products properly, supplying adequate warnings and manuals, and documenting their engineering and manufacturing processes. Taking all the right steps will help you to sleep better at night.



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