Have Rebreather, Will Travel

'Building a strong pillar to support the new rebreather revolution?

Text by and photos courtesy of Jorge Antonio Mahauad

As the word, *rebreather,* gains readership in diving magazines, brings novelty to shows and fills the mouths of renowned instructors many industry professionals are thinking of "rebreatherizing" themselves. This is predictable, as the rebreather has been hailed as the "greatest diving innovation since the regulator".

The fact is that in the advent of a new wave of recreational rebreather divers and the industry trend of making rebreather diving more available, many manufacturers are envisioning their own consumer rebreathers in the short and mid-term. At the same time, several recreational diving instructors wait for the "approved" units to come out while others are "taking the plunge" on units like the Poseidon MKIV. It is reasonable to think that a greater number

of dive centers will be willing to analyze the option of providing support services to rebreather divers in the near future. In this regard, it is highly likely that offering a wider range of services will become a source of competitive advantage as the recreational rebreather market expands.

It is reasonable to think that a greater number of dive centers will be willing to analyze the option of providing support services to rebreather divers in the near future.

In the last decade, technological advancements have allowed this futuristic technology to include automated mechanisms that will override and prevent reasonable user error. In addition, training to reduce the so called "human factors" is being designed, and it is expected that the application of multi-level sensory learning systems of proven educational value will help develop simple response mechanisms for quick bailout procedures to virtually eliminate fatalities. Nonetheless, many challenges lay ahead as the travel and leisure component is still undeveloped and underestimated as one of the pillars of this so called "new revolution".

So far, the additional business or the competitive advantage created by having a recreational (meaning no decompression, maximum 30 meters diving) rebreather operation have not overcome the extra work, expenses and potential liability that come with it, and some changes from manufacturers and training agencies are still needed in order to effectively develop the recreational rebreather travel sector.

In this article, I will try to list, expose and explain the components of rebreather travel and the general challenges the dive travel and leisure model faces. Hopefully, this will be of interest to manufacturers and training agencies that are willing to listen to others as part of their product development process. I think that this article can also be of value for the travel professionals thinking about getting into the rebreather market and to the people making decisions that will make such "evolution" happen.

Investment

Let's start from the beginning. Investment in developing, marketing and distributing rebreathers has increased in the last few years. It is foreseeable that this increased expense will create a greater number of opportunities and that diving instructors will provide training for many new entry level or "recreational" rebreather divers. If the equipment sales model is maintained, many of the new divers will eventually buy a rebreather.

Some changes from manufacturers and training agencies are still needed in order to effectively develop the recreational rebreather travel sector.

As the recreational rebreather diver spends money on a rebreather and develops skill, a new market for the rebreather traveler will develop. This new market will probably combine the well publicized destinations for recreational diving and the more specialized attention required to support a number of traveling rebreather divers.

Eventually, as recreational rebreather diving becomes an interesting product line for dive operators, a considerable amount of extra expense will be needed for diving service providers in the sector in order to cope with the base line for rebreather support and increased volumes of divers. As a result, additional investment in infrastructure, equipment and education will be required from the service provider intending to provide high standard facilities for rebreather divers.

Rebreather-friendly

Obviously, this investment will have to be offset by the benefits that serving rebreather divers will bring to the dive operator. But what are those benefits? What is worth the hassle and extra workload that rebreather divers create? Let's take a look at the current rebreather travel model and work it from there.

A place where rebreather divers are welcome is often called a "rebreather-friendly" facility. So far, these facilities have served the needs of technical divers in general, and some sort of community standard has emerged from the needs and expectations of this niche market.

In order to facilitate the modern closed circuit rebreather diver to a sport diving level, a "rebreather friendly" facility has to provide at least high pressure (200 bar) fills of medical grade oxygen and a reliable supply of oil free (tested), high pressure air. In order to make use of the gases provided, the dive operator will have to stock a range of rebreather tanks and valves, along with a choice of rigged bailout cylinders and regulators, and a stock of soft and trim weights in small increments. In order to comply with what the community now calls "basic support", the rebreather facility will also have to provide a range of CO_2 absorbent mechanisms such as grain or cartridges.

In addition to these basic features, a rebreather minded operation needs to provide certain infrastructure that includes a safe, somewhat private, well ventilated, cool, clean and grease free area for assembling and storing rebreathers. In addition, a dedicated space and water hose for rebreather rinsing is important; this area does not need to be exclusive, but it cannot be the same

A "rebreather friendly" facility has to provide at least high pressure (200 bar) fills of medical grade oxygen and a reliable supply of oil free (tested), high pressure air

Supervision is not easy with a group of bubble-less divers who are able to stay down for a long time

Procedures for entering the water will often require flexibility

used for rinsing wetsuits, BCD's, etc. There is nothing such as a rebreather "rinse tank".

Special care

Areas with changing currents, big waves, strong winds, open ocean locations, bad visibility or any other conditions that could be considered potentially (and reasonably) dangerous will have to provide special care if the rebreather-friendly operation offers boat (or supervised) dives.

Positioning

In my opinion, the rebreather operation should be able to estimate with reasonable accuracy the position of rebreather divers underwater depending on the currents, runtime and bottom topography for a standardized dive plan at any given time. On the other hand, a high tech solution to perform this task would be ideal and have great sales potential.

The challenges of providing the diver with underwater GPS, EPIRB and surface communications are well known and technology will eventually develop and provide this in a single, pocket sized, standalone and affordable device that is user-friendly and available on the consumer market. With time, such a device will become standard "support technology" for rebreather diving and traditional devices (DSMB's, audible surface aids, etc) will be carried as manual backup mechanisms.

There is nothing such as a rebreather "rinse tank".

Special needs

Aside from the "non-rebreather" technological needs of the travel professionals to serve rebreather divers, the staff of a CCR-friendly operation also needs to fully understand the principles of rebreather divers, be knowledgeable about a variety of units and be able to fulfill the customer's unique needs. This is easier said than done, and many so-called travel specialists often do not understand that rebreather divers do most things differently.

Consistency

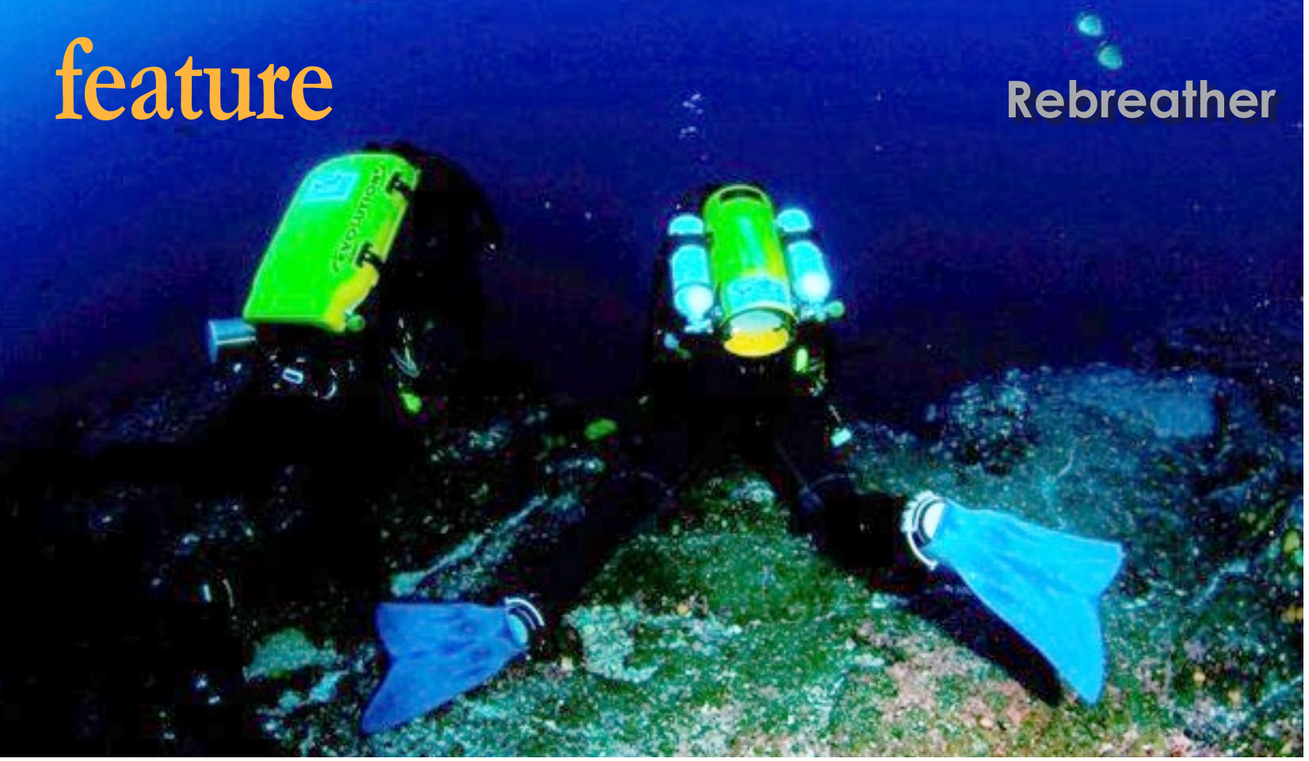
Dive operations offering guided dives will need to ensure that their guides are diving rebreathers consistently, that they are appropriately trained to assist on a rebreather emergency, and that they have top of the line understanding of physiology, equipment, underwater techniques, dive planning, etc. Guides will also need to understand that individual attention is essential; CCR divers cannot be rushed to get in the water, cut short on runtimes or be casually mixed with open circuit divers.

Procedures

The dive center that aspires to be a rebreather friendly operation also needs to revise monitoring and in-water procedures. For example, procedures for entering the water will often require flexibility. Locations where the practice is for "everyone to back-roll into the water at the same time" will have to implement a different approach. Supervision is not easy with a group of bubble-less divers who are able to stay down for a long time; therefore, pre-dive briefings, dive plans and surface support coordination will prove their often forgotten importance in the recreational open circuit diving field. Upon surfacing, tenders should provide a line to clip bail-out or stage tanks to and a long, strong and comfortable ladder with good hand-holds and safe steps for exiting the water while still wearing the unit.

Many so-called travel specialists often do not understand that rebreather divers do most things differently.

The rebreather facility also needs to offer a basic toolkit to allow servicing and a dedicated retail area offering a range of consumables available for sale that would include as a minimum, disinfectant, fresh cells, O_2 lube, batteries and reasonable support with some spare parts for the major rebreather models



and reasonable support with some spare parts for the major rebreather models.

Travelling

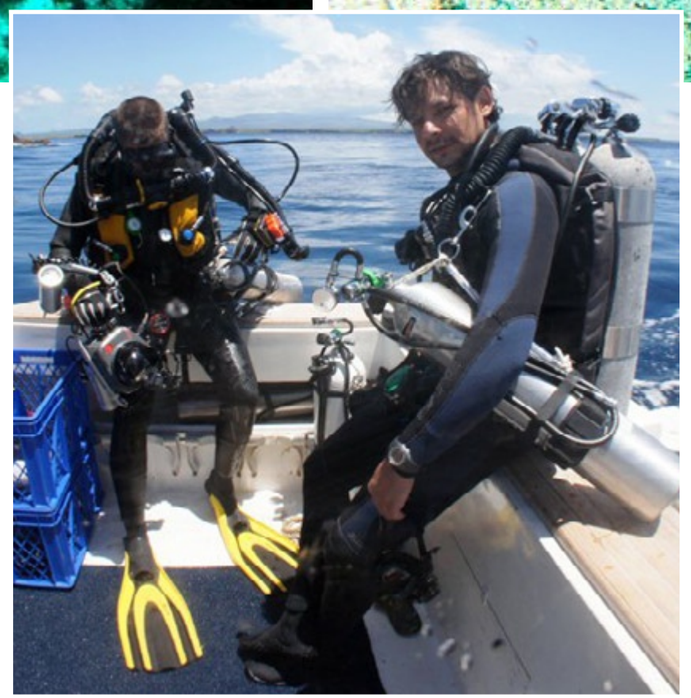
At this point I think it is important to make one clarification. The "requisites" above are not something I have personally authored. They are more of a potpourri of knowledge gathered from reading on line, meeting other divers and supporting some rebreather people. It is my experience that, although the process is often painful and full of uncertainty, if rebreather divers find some of those optimal features in a dive operation at an area with something worth diving for, they will slowly start to show up.

Getting there

But for the traveling rebreather diver, the hassle is not over by locating a "rebreather-friendly" dive provider in a nice destination abroad. First, they have to get there, and for such purpose packing, flying and entering a new country is often a tricky first step.

For some time rebreather manufacturers have been doing their best to develop a unit whose weight is approximately the same as a standard single cylinder scuba rig. Unfortunately, that is not enough anymore as weight restrictions have become tighter with more additional luggage fees being charged.

As a result, the rebreather traveler often has to resign him or herself to the use of hard boxes and other protective measures recom-



The expensive and heavy camera equipment that makes owning a rebreather worthwhile will also have to be added to the mix and the average 23 kilo baggage allowance will be quickly doubled or worse.

mended by the manufacturers. This practice reduces the overall extra expense in overweighed luggage but can also jeopardize the integrity of a very sensitive life support device. In any case, the expensive and heavy camera equipment that makes owning a rebreather worthwhile will also have to be added to the mix and the average 23 kilo baggage allowance will be quickly doubled or worse.

Weight restrictions have become tighter with more additional luggage fees being charged.

Security

A second factor that complicates rebreather travel is airport security. As the world's flights become "safer" every day, the list of restricted and suspicious items grows longer. Depending on where you travel from or to the terms rebreather, oxygen, gas cylinder, cell or solenoid can be very attractive to security officers. In addition, many components of a rebreather are not meant to be disassembled manually or require special tools and procedures for such purpose.

Even though short warning labels should be enough to keep the hands of the curious recreational rebreather owner away from something potentially dangerous, the special tooling or signs will not prevent the security screeners from using whatever is at hand to pull apart and examine a unit. Just Google "rebreather tsa", and you will find the most amazing stories of wings being punctured or sliced, items being removed from checked luggage and even whole pieces of luggage being confiscated for further investigation.

Try to explain...

When talking about traveling abroad one last challenge is still to be handled. Overweight luggage that has an "inspected" tag on it and that will look specialized and expensive in an X-ray scan will draw attention from the average customs officer. Trying to explain what this machine does, how much all the gear is worth or what you will do with all this is something that often complicates things a bit further.

All the challenges listed above are common to the individual that travels with scuba equipment but are often more complicated with a rebreather. The reason is simple; a rebreather is a more complex mechanism. In any case, this article is not about the downsides of rebreather travel but about the real challenges that the traveling rebreather diver has to face and how we, as travel professionals in the rebreather diving market, need to provide solutions for our customers.

Many conventional scuba equipment manufacturers have developed travel oriented gear

Tips

If we benchmark the regular scuba travel business a few tips are available. First, the traveler usually has real time access to information that allows "smarter packing"; in addition, many conventional scuba equipment manufacturers have developed travel oriented gear that is extremely light and compact. In the travel sector, some dive operators have created rental programs that provide to the experienced diver traveling light and to the entry level student different equipment lines. With this reasoning, maybe the best direction for the rebreather travel market would be to develop and offer lighter rebreathers and to standardize rebreather rental pro-

grams that could be provided by the so called rebreather friendly facilities. Again, this is easier said than done.

A rental scuba regulator will always work in the same way and there is no special training required to use a particular model; moreover, if the diver's brand of choice is not available for any reason, there is always the option to grab anything working "fairly okay" and still make a couple of dives. On the other hand, rebreathers require unit specific training and dedicated top of the range servicing in order to be in a condition to conduct safe dives consistently.

High investment

If a rebreather facility wants to provide rental units and serve all the potential combinations of rebreather models, the investment needed is very high. On the other hand, if a particular rental rebreather is not available, or if the unit is not supported at a destination, this will personally affect a diver who committed a considerable amount of money in a brand of choice. This situation is never good for the brand and will hurt the relationship with the costumer in the long run because the customer will have to either change brands or choose a different destination. If the customer still wants to dive that destination and the required rental units are definitely not available, then we are back to the original travel, safety and weight issues.

Maybe the best direction for the rebreather travel market would be to develop and offer lighter rebreathers and to standardize rebreather rental programs that could be provided by the so called rebreather friendly facilities

Despite the increased expense in product development and marketing of rebreather related subjects in the last few years, this important issue remains mainly unaddressed. The "bubble-less dream" of a manufacturing industry providing technology and training without the travel pillar in place somehow resembles what happened back in the mid 1990's with a "first wave" of semi-closed rebreathers that did not succeed completely in the market. I think that the rebreather travel market strongly developed back then and that the industry professionals making the "new" revolution happen need to take this into account now.

Program development

In my opinion, if the rebreather revolution is to be successful this time, rebreather manufacturers need to approach travel specialists all over the world in order to develop a rebreather rental program very quickly. This program will have to provide options and support to the dive operators who want to include their units as part of the "menu" on offer. I know of at least one company that has something in this fashion but a common effort is needed to make it a trade standard in the rebreather market. Another step towards the development of this third pillar of the recreational rebreather model is standardization.

Simple things like the scrubber mechanisms have variations in size, duration, specification, and packing from one rebreather to the next. Cylinders and valves are other examples. Usually when diving open circuit, a DIN to Yoke adapter or valve

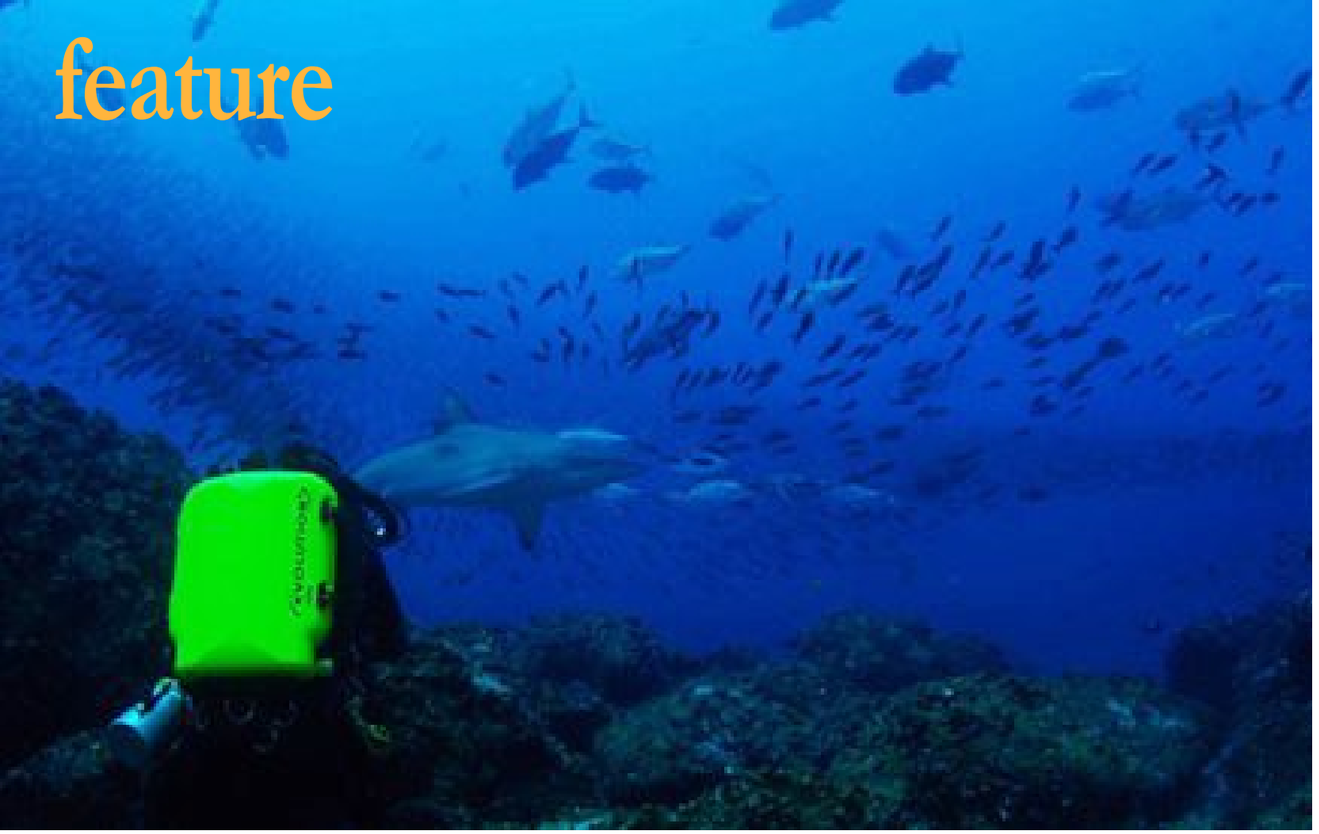
Many rebreathers require a specific size of cylinder and type of valve to fit properly.

Rebreather

insert will be everything a diver will need to fit a regulator in a cylinder. Rebreathers don't work that way. Many rebreathers require a specific size of cylinder and type of valve to fit properly. Modifying such configuration will usually alter the learned response to potential problems, invalidate certifications or simply make diving impossible. Even small consumables such as batteries, oxygen cells, tools, "o" rings, mushroom valves and fittings will not work from one unit to another proving the task of providing "reasonable support with some extra spare parts for major rebreathers" more complicated than initially thought.

Benefits

Aside from the technicalities of rebreather travel one last aspect remains.



How much more revenue can a rebreather diver create (over the more conventional open circuit diver) in order to make this profitable to the dive operator at a travel destination? Is the investment in training, infrastructure, consumables, rental rebreathers, gasses and logistics worth the rewards?

Can the manufacturing and training sectors of the industry support travel professionals to make it worthwhile? I know profitability depends on the particularities of every region and business model, but I think we can talk about potential trends.

Initially, the benefits of supporting rebreather divers will probably be collected by charging a "premium fee" and by gaining reputation and competitive advantage over the other dive shops, just like what happened with the premium fees and "specialized" equipment sales that the use of Nitrox produced back in the late 1990's and early 2000's.

But as the market matures these extra margins will eventually decrease and being rebreather-friendly will probably become mainstream product component, just like what made nitrox a "free gas" in many dive operations today.

At this stage, questions about economical sustainability of this could come to mind. Aren't we deliberately reducing the price competitiveness of the "scuba diving industry" by making "diving" more complex and by including extras to a sector with already low average profitability?

Things are changing very quickly in the rebreather world these days. Maybe by the time this text is published, half of the information here will be obsolete or inaccurate. On the other hand, as the rebreather travel market expands, the challenges and complications will increase and an unhappy scenario for manufacturers and training agencies could result if the travel component is not there to provide what they promise.

I think that if we are going to make this rebreather revolution happen, more cooperation and communication with the travel destinations as a sector will be needed. Maybe the upcoming rebreather forum 3.0, RESA, and other industry initiatives will address and proactively advance this exciting new frontier in diving. ■

Jorge Antonio Mahauad is a PADI/DSAT Master Instructor, Trimix Instructor and Evolution rebreather diver based in the Galapagos Islands.