Y2K C2R Diving

by
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Here comes the new millennium, approaching at a pace of a skydiver at terminal velocity. You have fears of Y2K and the world ending. Some of those fears are justifiable and most are not! Using the latter as an example safety issues relating to certain types of rebreathers are exaggerated, or critical points of information are intentionally not mentioned.

All of the misinformation is generally targeted to promote sales of some item that is implied to promote a greater degree of confidence. False confidence or overconfidence is generally the product of such misinformation.

This article will address some of the valid points of rebreather design and concerns that divers have of the safety of diving a rebreathing system.

To understand rebreathers, some principles of operation must be understood. Recirculate the breathing gas for reuse, remove carbon dioxide from the breathing loop, and add oxygen to the breathing loop to replace oxygen consumed.

The failure of any of the above will ruin your day or just your dive. So how does a diver build a defense against drowning? Start off with training from an instructor who has valid field experience and not just book experience. Remember that you will only learn what your instructors know and their training is diluted from the instructor who trained them.

Next, talk with the manufacturer, and see how they address the levels of potential problems that can be foreseen while diving a rebreather. Addressing three of the most dangerous failures, one being a TLF a total loop failure, this may be caused by octopus wrestling or playing snaggle tooth with a forty-six pound ling. Obviously a TLF is a loss of a breathing hose or the catastrophic loss of loop integrity. Anyway, it is a non-recoverable event, period.

So what is taught in the world of rebreathers for TLF? "When in doubt, bailout!" Problem: how do you bail when your decompression or overhead environment will not allow it? What was ok for closed circuit decompression is not ok for open circuit bailout especially when the unit you are diving holds two dinky 15 or 21 cu.ft. pressure vessels.

Let's see, I was diving an equivalent FO2 mix of 32% and now I am diving air because that was my diluent on my rebreather, or on a semi-closed I was using 32% and I lost my loop. What do I breathe on for my ascent, safety stop, deco stop or exit from a penetration?

The answer is, you got it, I must carry enough gas calculated for my R.M.V.(residual minute volume) to take myself through my dive plan and contingencies. My point is there is not a rebreather out there that is properly designed to comfortably carry all the gases needed for most recreational diving. What is needed is a rebreather that will mount gases in the appropriate pressure vessels on the rebreather itself. One rebreather on the market can support an entire bail out. However, how many pack mules does it take to get it to the beach or how many boat slaves do we have to feed to help you climb the ladder or put the thing on.

Two other problems while diving that will hammer reality home is loss of scrubber function (Hypercapnia), and oxygen starvation (Hypoxia). Again what is taught is “when in doubt, bailout!” Generally this means closing the dive surface valve and stuffing your safe second in your mouth. This is a formula for failure. As long as the diver has loop integrity, stay on the loop. Any decent rebreather on the market has a lung demand valve in the loop. Think of this as a second stage. All the diver must do, when in doubt, is descend to increase the PO2 in the divers brain to avoid passing out immediately, then go open loop on the rebreather using the lung demand valve.

Inhale from the loop and exhale from your nose. For either a scrubber failure or hypoxia, if you don’t hear water sloshing around in your loop, use the loop and use the rebreather for what is was meant to do, keep you alive while diving. Remember, that every time you inhale through the lung demand valve, you draw what is in the pressure vessel that being 32% or higher oxygen. Essentially you are on open circuit.

InnerSpace Systems Corp (ISC) has designed equipment and developed training for the diver to maximize fun and feel confident in their ability to select the right course of action if a problem occurs. The ISC Guardian variable volume mixed gas rebreather has been designed with redundant operating systems which are available for use by the diver should a partial or full systems failure occur during a dive. All of the emergency countermeasures, however, require correct diagnosis of the failure, then use of the appropriate countermeasure. Even in the event of a total system failure (i.e. loss of electronics, loss of scrubber, loss of oxygen, partial loop failure, TLF, and the loss of all display information at the same time), the diver will have the time to take corrective action as instructed.

All of the above stated events happening at the same time is unlikely but you never know when you might have a bad day. If you have proper training on a decently engineered rebreather, you can feel confident you can go home after the dive and E-mail all your buds about your experience.