

“The Deadly Octopus”
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There is a cute animal that lives among the Australia reefs. It has eight arms and is marked with blue rings. Of course it is the deadly Blue Ring Octopus.

There is another octopus, the one which divers use as a back up regulator. It has an arm extending from the first stage regulator and if not used properly it also can be very deadly.

The function of this back up octopus regulator is to serve as an alternative air source to be offered in case of an emergency to a diver who is out of air underwater, and enable both the donor and the out of air diver means to make a safe ascent to the surface. This sounds like a reasonable safe procedure, however there are some factors to consider. Does the donating diver have enough air to share with another diver to make a safe ascent?

Two divers entered the water together and have spent an equal amount of time at a depth of 100 fsw, (4 ATA). One diver runs out of air and rushes over to the buddy frantically pointing the customary out of air signal. If one diver managed to run out of air, how much air is it expected that the other diver has left? Is it reasonable to assume 600 psi, to be generous how about 800 psi. In an aluminum 80 cuft cylinder that equals to approximately 21 cuft of air.

There is no doubt that the donating diver seeing his buddy in distress will get excited and begin to breathe much heavier, perhaps four times or more. The out of air diver once the octopus is available to breathe will no doubt for the first few moments breathe even more, six to eight times.

Considering that a fairly comfortable diver has a surface air consumption (SAC), especially in cold water, approximately .7 cuft/min. At a depth of four ATA's that will amount to 2.8 cuft/min. At the time of emergency the consumption would increase by a factor of at least four, amounting to 11.2 cuft/min. The diver out of air will breathe approximately 22.4 cuft/min. Both divers together will be breathing over 33 cuft/min. Having a supply of only 21 cuft, both divers at that depth would have approximately 30-40 seconds to get the situation under control, organize and make the ascent. That is hardly enough time for most divers to accomplish this task.

A further complication of placing such a demand on the first stage regulator in cold water is likely that the first stage will freeze up and begin to free flow, which will dramatically deplete the supply of air ever quicker.

The “Alternate air source”, the “back up regulator”, the “octopus” or the “Safe Second” as it is sometimes called, all sound like a reasonable out of air emergency bail out solution. However, in most cases “Alternate” is not good enough, it does not provide an emergency redundant air supply. More regulators from one source do not provide an emergency redundant air supply. The only

true redundant system is a pony bottle. The pony bottle should not and is not extra air supply to extend bottom time. It is only in case of an emergency, to be offered to another diver who is out of air, or in case of a catastrophic equipment failure to serve as a back up air supply for the diver. The size of the bottle is equally important and should be selected according to the planned depth of the dive. The pony bottle should provide enough air to allow a safe ascent from depth, and allow a safety stop at a comfortable breathing rate. Descending to depth is an option, returning safely to the surface is mandatory.