



opinion

Text by Simon Pridmore
Photos by Marco Daturi

It was a beautiful Caribbean day, water conditions were excellent but Anna was feeling confused. Water had started to seep into her mask and, although she knew how to clear it, somehow she was unable to get the water out. She started to ascend.

Concerned, the divemaster followed her up, signaling to Pauline, the other diver in his charge, that she should wait and he would come back.

On the surface, Anna removed her regulator, adjusted her mask, gathered her thoughts and decided she had been foolish. So, although she still did not feel well, when the divemaster swam over, she gave him the thumbs down signal, indicating that she wanted to continue with the dive. However, when they descended again, Pauline was nowhere to be found. By this time Anna was sick and disorientated and the divemaster, too, was having problems.

"I was dizzy," he said. "I don't remember much, but I know my eyes closed at some point, and right before we reached the surface, I had a pain in my chest. I felt terrible."

So they went back up and raised the alert. A search was carried out for



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Carbon Monoxide

Pauline but she was never found. An investigation began several days later, but by then the equipment the divers had used had disappeared and a medical examination of Anna and the divemaster revealed nothing abnormal. Although they could not be sure, given

the circumstances investigators strongly suspected that the culprit was one of diving's "black" gases, carbon monoxide.

What is carbon monoxide?

Carbon monoxide is a completely invisible, tasteless and odourless gas that is

formed when fuels such as gas, oil, coal and wood do not burn fully. It is very poisonous, has an immediately harmful effect on your respiratory system and is potentially fatal if it gets into your scuba cylinder, even in very small quantities.

Why is this?

The reasons for the toxicity of carbon monoxide are poorly understood. It is well-known that it bonds with the haemoglobin in our bloodstream much better than oxygen, so the presence of carbon monoxide can lead to a reduction in the





carriage of oxygen to body tissues. However, at mild to moderate levels this can be compensated for by an increase in blood flow so that, although the blood contains less oxygen, oxygen delivery is maintained. It seems that carbon monoxide also has other effects on cells within tissues (particularly the brain) and that these produce the toxic symptoms.

How can it get into a scuba cylinder?

Carbon monoxide can get into a cylinder while it is being filled if there is an engine exhaust close to the compressor's air intake. The source might be the exhaust from the compressor engine itself if it is broken or poorly located or, on a liveboard, it could be fumes from the boat engine. On land, the carbon monoxide could simply come from a car with its engine running parked close to the dive shop's compressor room.

How will you know?

Without deploying a little technology, you won't know! Analysers are now available that can be used to detect the presence of carbon monoxide in a scuba cylinder. For around US\$300 you can buy an analyser that you can screw on to your cylinder before a dive and test your air or nitrox to check that it is not tainted by carbon monoxide. The electro chemical sensor is user-replaceable but, unlike an oxygen sensor, does not need periodic calibration.

Similar devices are available, which dive centres and filling stations can use, that will warn them if carbon monoxide is present in their systems. Logic suggests that if you dive with operations that use these detectors, you can feel confident that you don't have to deploy your own.

Otherwise, the first indication you get that you have carbon monoxide in your breathing gas will be

that you start to feel unwell during a dive. The symptoms are headaches, irritability, dizziness, confusion and shortness of breath. The confusion is a complicating factor because it means that your judgement will be impaired and you may not immediately take the correct action, which is to gather your dive team and all ascend together.

Two golden rules to follow:

1. If you feel unwell during a dive, abort.
2. One up – ALL up: no questions, no exceptions. ■

Simon Pridmore has been part of the scuba diving scene in Asia, Europe and the USA (well, Guam) for the past 20 years or so. His latest book, also called Scuba Confidential, is available in paperback and e-Book on Amazon.

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