Use of pre-mixed nitrox gases

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An incident has been brought to IMCA's attention where premixed cylinders or quads of nitrox gas may not have had the necessary oxygen content to sustain safe diving and the cylinder or quad may not, in fact, have contained the mix that was indicated on the label and/or accompanying paperwork.

What happened?

In a recent near-miss incident, a contractor was conducting diving operations using third-party-supplied cylinders and quads of premixed nitrox via a dive control panel arrangement that fortunately included in-line gas analysers.

In a situation where the nitrox mix should have had a 36% oxygen content, during the operational monitoring process the contractor chose to immediately suspend diving operations when a reading of 32% oxygen content was observed by the panel operator and supervisor. Further tests were conducted which verified that the nitrox gas supplied was not the correct gas mix for safe diving operations.

During subsequent testing of both the cylinders and quad contents, an oxygen content of approximately 15% was observed in some cylinders, a percentage well below that specified and at a level where a serious incident could have resulted.

Since there is an obvious increased risk of decompression sickness when the oxygen content of the nitrox mix required is less than the oxygen content specified in the decompression tables being used, attention to detail is critical. In this instance it was only the vigilance of the contractor that detected the problem before an incident occurred.

Lessons learnt

The following lessons may be drawn:

- The mix of the gas should be clearly specified to any third party supplier and knowledge of their quality assurance system known and understood before an order is accepted for operational use.
- Cylinders and quads delivered from third parties should have their gas content analysed after delivery and certainly before first use on site.
- The use of panel mounted in-line gas analysers has proved to be extremely beneficial in this case.
- Particular attention should be paid to individual bottles within their racks

as any bad mix could dilute easily into the pack and not be found. If such a bottle were utilised as a single source for supply it would be particularly dangerous.

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