

Failure to follow gas quad procedure

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A member has reported an incident in which a quad of diving quality air was mistakenly connected to a saturation system instead of diving quality oxygen and was injected into the chamber during metabolic make-up.

What happened?

The incident occurred during mobilisation operations; two 48 bottle gas quads were delivered to the vessel and were signed for by the on shift life support supervisor (LSS). Gas quads of diving quality oxygen had been expected, but a mistake had been made during the ordering process and the incorrect gas had been ordered. Diving quality air had been selected instead.

The quads were delivered to the vessel and signed for but no thorough checks, as per the existing procedure, were completed to identify that it was not the correct type of gas. The quads were removed from the lorry on the quayside and then lifted aboard into the correct gas storage area. Later that day, the on-shift LSS went up to the gas storage area and connected the first of the gas quads into the system. However, this task was stopped mid-way through without the full range of operational checks being completed, as the LSS left to attend a project briefing.

Following the completion of the project briefing the LSS did not return to the gas storage area to complete the remaining checks for the task. The divers entered the dive chamber system, where saturation control proceeded to blow them down to a holding depth of 20 metres of seawater (msw). This blow down was completed using the correct gas from the onboard storage. After several hours in the chamber at the holding depth the oxygen content (ppO₂) in the system dropped and automatic injection of further oxygen was activated. After approximately 15 minutes the on-shift LSS noticed that following the O₂ injection the oxygen content (ppO₂) had not risen to the expected levels and decided to investigate by inspecting the quads on deck.

On finding that the attached quad was diving quality air and not diving quality oxygen, the LSS immediately isolated the attached quad and vented any remaining air from the system to prevent further ingress of nitrogen to the chamber. The divers in the chamber were checked for any signs of ill effects, but none were found. The incident was reported to the vessel management and an investigation began.

An investigation revealed a number of factors and procedural failures which led to this incident occurring.

- The incorrect type of gas was selected during the ordering process which led to the incorrect type of gas being delivered to the vessel.

- There were established company procedures which were not followed: *“Safe Working Practices – Gas Management. Section 3.4 – All diving breathing mixtures should be checked on receipt and rechecked immediately prior to connecting them to a diving gas supply or breathing apparatus charging system. Analysis should additionally be continued whilst on line and in use”*
 - the on-shift LSS did not complete all the required company procedural checks to ensure that the gas being received and signed for was what the vessel actually required
 - the on-shift LSS did not correctly inspect the quad or gas type prior to connecting the quad to the system as per the above-mentioned procedural requirements
 - saturation control did not fully analyse the gas prior to the automatic injection being activated and the gas entering the system, as per the procedural requirements.

The following actions were taken:

- Robust review and application of existing procedural requirements for gas management.
- Onboard management to create specific standing orders to support the requirements and implementation of the gas management procedures.
- Identify and clearly communicate who onboard is authorised and competent to receive and verify gas deliveries.
- vessels to utilise Analox portable ATA analyser to ensure gas analysis is complete before connection to a supply system.

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