

Karl W. Mueller

From: Association of Diving Contractors International [Newsletter@naylorcampaign11.com]
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To: Karl W. Mueller
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ADCI Advisory Notice

The following items of information are provided to bring your attention to recent industry developments, initiatives, or safety notices.

DETAILS

ADCI Informational Update 2014 - 37

The following information is provided with permission from the Shell Group technical Authority / Principal Technical Expert Diving of the Shell Global Diving Center of Excellence.

Injuries due to Failure of Diver's Emergency Gas Cylinder

What happened?

The incident occurred onboard a Diving Support Vessel (October 2014) while divers were dressing in out in preparation for a dive. A valve forcefully parted from a high pressure (HP) cylinder filled with 180 bar (2610 PSI) of compressed air. In total, five divers were injured by the parted valve as it flew off the cylinder.



Figure 1: Permanent markings on top of air cylinder with thread specs: M25x2 - ISO.



Figure 2: Example of pillar valve with 3/4" BSP parallel thread and no markings or thread specs.

Why it happened

The investigation of the incident is still ongoing, but the preliminary assessment has confirmed that the inner thread on the HP cylinder was not

compatible with the outer thread of the pillar valve.

The HP gas cylinder inner thread was an M25x2 parallel thread, and the outer thread on the pillar valve was a 1/2"x14 BSP parallel thread (Whitworth). How the incompatible valve and HP gas cylinders came to be used together is still being investigated.

Lessons Learned

The incompatibility of the valve thread and HP cylinder thread led to a serious incident. It is, therefore, of great importance that contractors perform an immediate check to confirm the compatibility of the HP gas cylinders and valve threads in use at the operations. They should also clearly mark and register both HP gas cylinders and valves separately, so that compatibility can be verified and assured.

Recommended Actions

- Check HP gas cylinder threads and pillar valve threads for compatibility.
- Mark the cylinder thread size for all HP cylinders; mark the thread size for all pillar valves, applying a unique identification that will be permanently visible and traceable.
- Have working procedures and instructions in place that include the verification of the compatibility of both the pillar valves and HP gas cylinders.
- Include compliance with ADCI Consensus Standards, which require annual internal and external visual inspections of HP gas cylinders.*
- Include the HP gas cylinder and pillar valve identification numbers in the annual inspection.*
- Observe the above recommended actions when using this type of cylinder, outside of diving, due to the potential for the same type of failure.



Figure 3: Inspection of the inner thread type at an HP gas cylinder.



Figure 4: Inspection of the outer thread type at a pillar valve.

Technical Details:

A pillar valve or cylinder valve is the point at which the cylinder connects to the diving regulator. The purpose of the pillar valve is to control gas flow to and from the cylinder. The neck of the cylinder is internally threaded to fit a cylinder valve. Parallel threads are made to several standards and the most common standards are: M25x2 parallel thread, which is sealed by an O-ring, M18x1.5 parallel thread, which is sealed by an O-ring, 3/4x14 BSP parallel thread, which has a 55°Whitworth thread form, 1/2"x14 NGS (NPSM) parallel thread, sealed by an O-ring, 1/2"x16 UNF, sealed by an O-ring. These parallel threads are very similar, but not compatible, as pitch, pitch diameter and thread forms are different.

*recommended testing guidelines found in the ADCI Consensus Standards for Commercial Diving and Underwater Operations. These are not Shell recommended guidelines.

This Information was sent to further the communication of all industry stakeholders. Safety is the primary concern of the ADCI. Remember: a real-time Job Hazard Analysis is important, but nothing can replace good common sense.

Sincerely,

Phil Newsum
Association of Diving Contractors International

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We would appreciate your [comments or suggestions](#). Your email will be kept private and confidential.