

Nitrogen cylinder ruptured

Safety Flash Published on 3 September 2024 Generated on 28 January 2026 IMCA SF 18/24

A high pressure nitrogen cylinder in a quad of 12 cylinders located on a drill rig floor ruptured without warning.

What happened?

The cylinders were charged to 2,400psi and were not connected to anything else at the time of the incident. The rack was destroyed and the other cylinders in the quad were propelled by the blast up to 15m away.

Why did it happen?

The base of the cylinder that ruptured was heavily corroded. Other cylinders in the quad had evidence of similar but less severe corrosion.

The cylinders were 9 years into their 10-year hydrotest cycle, and had been visually inspected by the supplier in accordance with applicable industry guidance, when they were refilled some three months before the incident, before being loaded out to the rig. However, the severe corrosion that caused the rupture was not spotted during this inspection;

The cylinder that ruptured was located in the middle of the quad and therefore not easy to properly inspect without disassembly of the quad.

Calculations showed that the fatal blast zone for a single cylinder of this size pressurised to 2,400psi would be around 1.5 metres. The severity of the blast caused the rack to be destroyed and the other cylinders to be propelled across the deck.

Lessons learned

- Are the cylinders on your facility or vessel certified and in good condition?
- Are you able to see the condition of all cylinders in every rack?
- Are all cylinders located on a free draining base to minimise corrosion?
- Do you know what level of visual inspection of cylinders/quads is provided by your supplier?
- Are all cylinders on your facility stored and located in accordance with the relevant industry regulations?

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