Near-miss during connector pressure tests

Safety Flash Published on **1 January 2006** Generated on **14 January 2025** IMCA SF 01/04

A member has reported a serious near-miss event which occurred recently during a diving operation.

What happened?

Divers had fitted a collet connector to the open end of a flooded pipeline and were testing the annulus between the seals within the connector to ensure that it had sealed correctly to the pipeline. A quick disconnect (QD) type hydraulic (male) fitting had been connected to the annulus port of the collet connector and a hydraulic test line run from the surface to apply test pressure of 900 psi. The QD male connector had an integral non-return valve, which would allow flow in both directions through a poppet arrangement on the male and female parts.

The test was applied and a successful result was achieved over the test period. The pressure was reduced to zero on the surface and the test hose removed, by undoing the female QD from the male part fitted to the collet connector.

When the diver started to unscrew the male fitting from the annulus port, it blew off, as a result of entrained pressure within the void of the annulus.

The fitting was lost in the mud on the seabed, so it could not be examined afterwards. However, the most likely cause of the event appears to be due to failure of the poppet arrangement on the QD. Such failure had not been taken account in the procedure or the risk assessment.

Our member concluded:

The company has determined that an additional check should be made by the use of a tee and needle valve – a check which it will introduce in future onto the annulus port/QD part of the circuit, so that pressure can be confirmed as being bled to ambient before disconnection of the hose from the QD fitting.

The company has noted that this configuration may also be applicable for other pressure testing situations, to confirm that the pressure has been brought to ambient, but, as a minimum, procedures and risk assessments should evaluate whether there is the possibility of entrained pressure through blockage or through the failure of a hydraulic valve

and should take that possibility into account when removing the test fittings.

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