

Incident description: gas leak 2016

During commissioning of a gas lift line, a gas leak occurred when the tube fitting for a pressure gauge came free. This fitting had been incorrectly installed. Small tolerances mean it has proved difficult in practice to spot installation errors in fittings, since these cannot always be identified by leak testing. Leaks from erroneously installed fittings can arise after periods of varying duration in operation, when the fitting has been affected by variations in pressure, temperature and vibration.

The gas leak was estimated at 62kg, with an initial leak rate of 1.2kg/s.

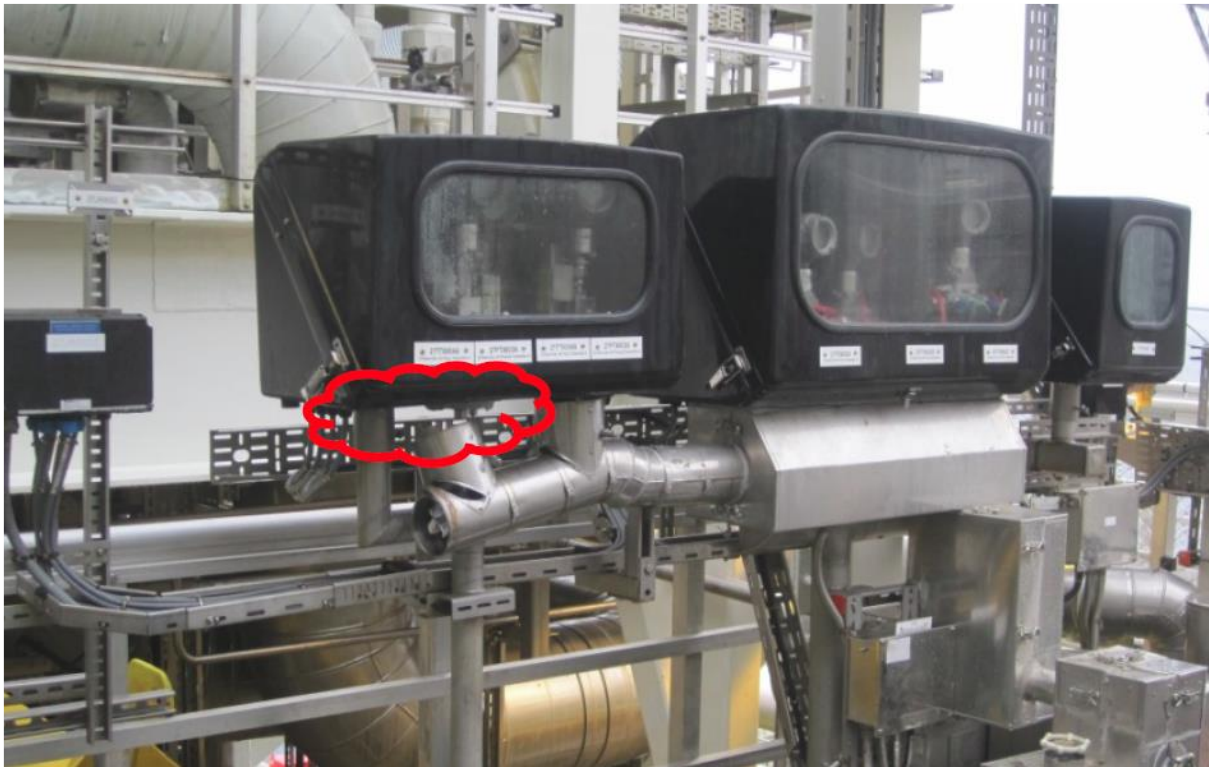


Figure 1: Leak point on the tubing.

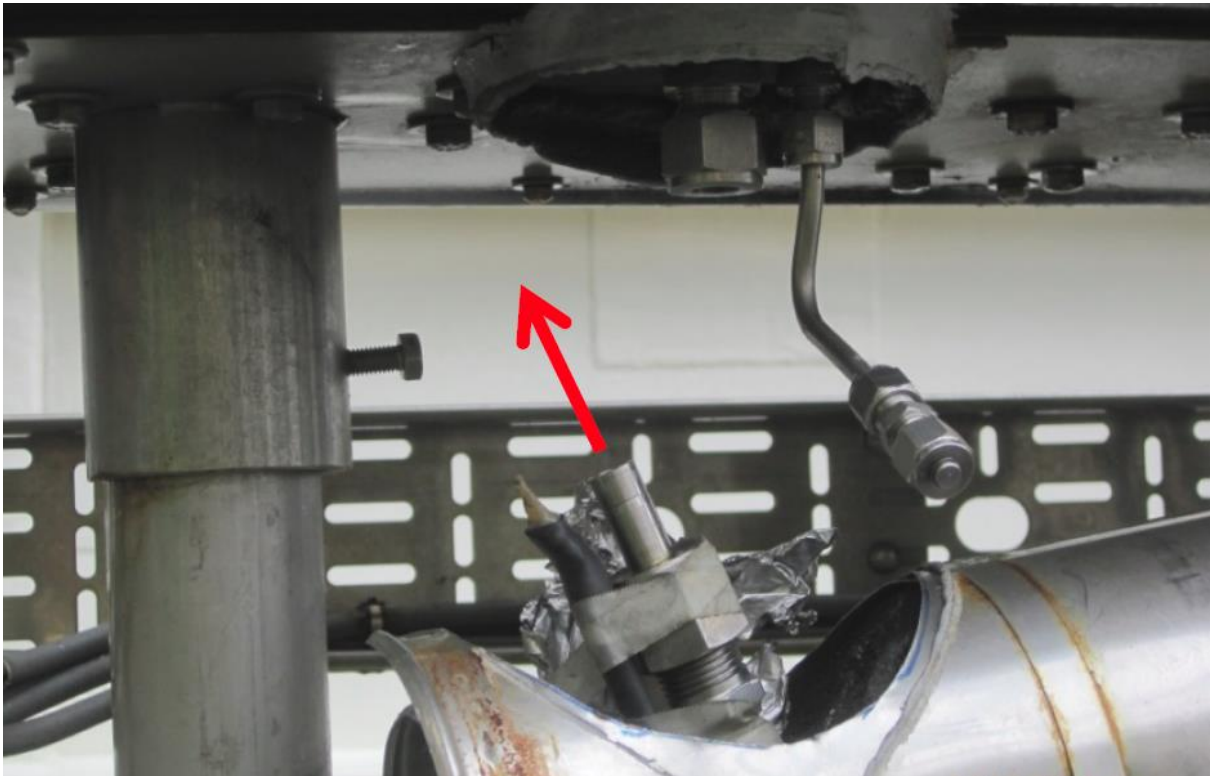


Figure 2: Leak point on the tubing after part of the insulation and sheathing has been removed



Figure 3: Erroneously installed fittings.

Causes

Direct cause

- Fittings in an instrument tubing came free.

Underlying causes

- Error in installing the fittings. There was no sign of deformation where the front or rear retaining ring came into contact with the adapter. Moreover, the retaining ring was in the wrong material.
- The error in installing the fittings was not detected.
- Pressure and leak testing was conducted at handover from project to operations without the erroneous installation being detected.
- The tubing is not included in random checks of pipe fittings.
- Technical material investigations show that the wrong components have been used in fittings which connected the tubing to cabinets housing pressure, temperature and flow meters. The wrong method was also used, in that the components were not correctly matched and screwed tight enough. Nor was the instrument tubing constructed in accordance with the drawing.

Lessons and recommendations

- Improve and maintain the quality of fittings:
 - inform all current projects that a pressure test does not expose all installation errors
 - follow up the personnel responsible for installing fittings, including a check of competence requirements.