

Incident description: gas leak 2017

An Xmas-tree test was to be carried out on a well by pressurising the tree with hydrocarbon gas from another well via a pressure equalising manifold. This was done during the evening by the night shift. The area technician was alone in the module during the job. The gas detectors in the module were overbridged by the control room operator before the job started.

The area technician opened the valve on the other well in order to introduce gas to the pressure equalising manifold. Shortly afterwards, he heard an unusual noise – “as if somebody was using a compressed air tool in the module”. He closed the valve, went up to the Xmas-tree deck and towards the well which was due to be tested/pressurised. He observed the gas leak at about the same time as he was called via walkie-talkie by control room operator 1.

Initial gas detection in the module occurred less than a minute later. Control room operator 1 then contacted the area technician by walkie-talkie, reported the gas detection and asked whether the technician had things under control. This was confirmed by the latter, who reported a little gas in the area by the flowline. He also reported that gas flow was turned off in the pressure equalising manifold and that the latter had to be opened for blowdown. When control room operator 1 did this, the pressure sank quickly and the leak ceased. About three minutes later, the detectors in the module were no longer detecting gas. Since overbridging of gas detection in the module was not terminated, no alarms sounded on the platform. The platform management was not informed of the incident.

Accompanied by a colleague, the area technician carried out a new cautious pressurisation of the segment with hydrocarbon gas to locate the leak point. The valve on the other well was cautiously opened again, while the colleague stood upwind of the assumed leak point. When he heard a noise from the piping section, he went over to feel by hand which flange was leaking and thereby located the leak point. The segment was then depressurised.

The operations and maintenance manager was informed about the incident at the shift hand-over the following morning. The incident was communicated as a minor/insignificant gas leak which had been clarified and dealt with. In the wake of the incident, however, the leak has been calculated at 0.17 kilograms per second (kg/s) for two-three minutes. The total emission has been calculated as 18.5 kg of gas.

The investigation report is critical about the extent of overbridging, which covered the whole module. The only expected hydrocarbon emission from the relevant job would have been pressure reduction from the Xmas tree in the event of an internal leak in one or more valves. The investigation team formed the impression that a practice had developed where this type of overbridging was normal in order to avoid unnecessary production shutdowns. The overbridging was not regarded as anything extraordinary, and was not followed up or monitored in any special way during the shift.

The investigation team also questioned what risk assessment had been carried out when those involved decided to reintroduce hydrocarbon gas to the plant after they knew a leak actually existed.

Considerable time was devoted to acquiring facts, registering the case in the incident report (RUH) system and calculating the leak rate. This also led to late notification externally.

Causes

Direct cause

- The seal ring in the flange was corroded.

Underlying cause

- Seal rings of the wrong material quality were installed in connection with the conversion of the pipeline a few years earlier.

The relevant pipeline has been checked and repaired. No need for further technical measures or action directed at material quality has been identified.

Lessons learnt and recommendations

- Set clear criteria for the permitted extent of overbridging for gas detection.
- Establish routines which ensure that the risk associated with overbridging will be assessed and managed in each case.
- Ensure good internal communication of incidents, and compliance with requirements for notification.