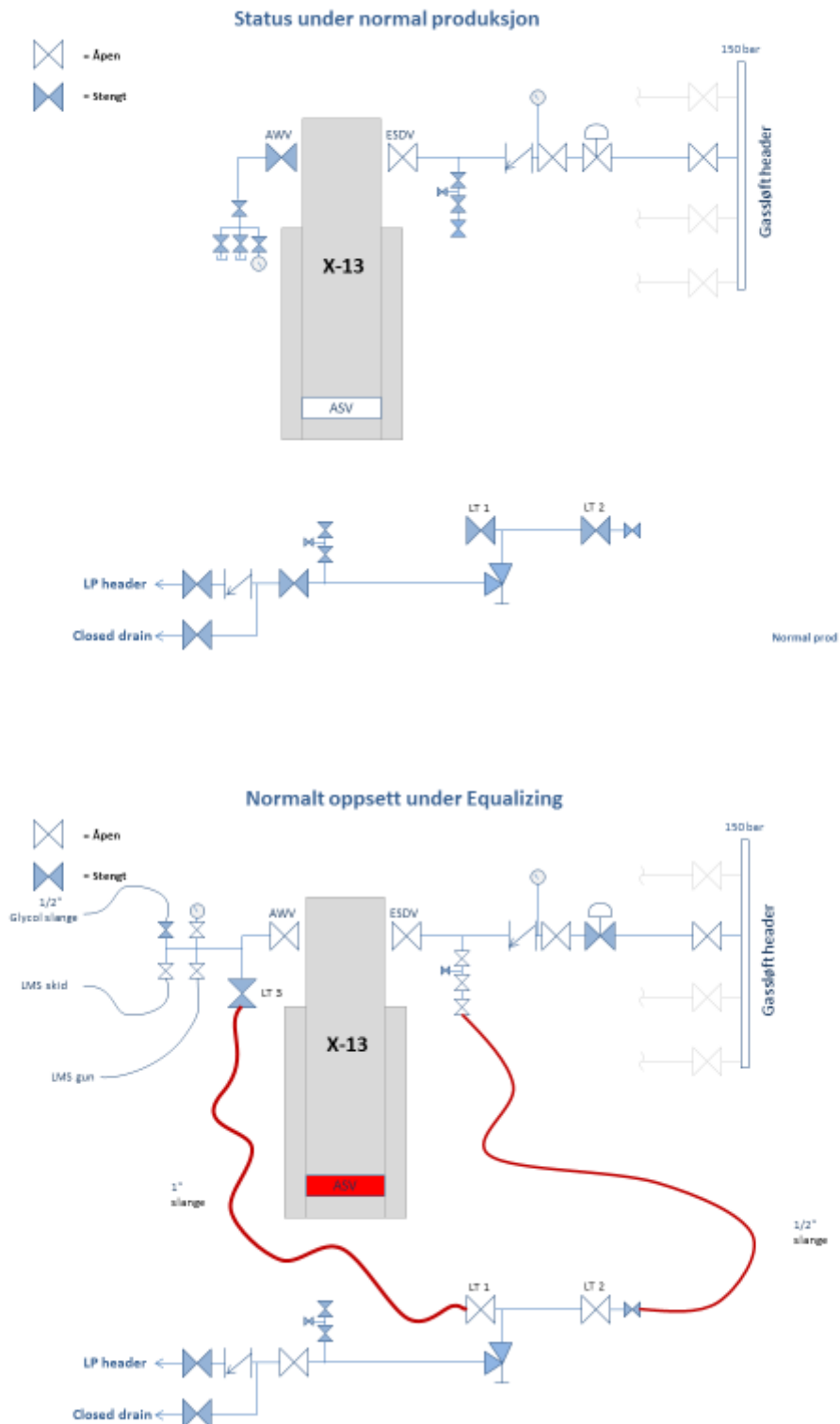


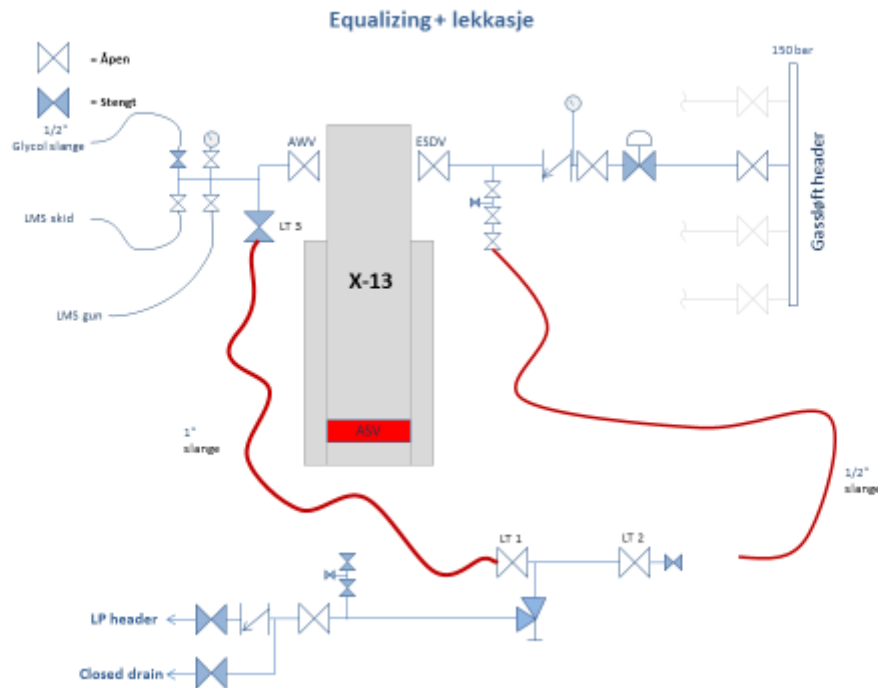
Incident description: gas leak 2015

The incident occurred during preparations for a routine leak test of well barriers in the annulus. Before the leak-testing equipment can be connected to the well, adequate isolation must be achieved.

A half-inch hose connection upstream from the ESD valve was used in part to bleed off pressure in order to install the leak-testing equipment. The hose had no role in performing the actual test. However, it was not reconnected after bleed-off as required by the procedure.

After the set-up had been tested, gas was introduced to equalise pressure across the annular safety valve (ASV) by opening a manual flow control valve to the gas lift manifold.





Gas escaped to the well area through the half-inch hose. The automatic shutdown and deluge initiation system was activated. The quantity of gas was minimised through automatic shutdown, and further reduced by closing the flow control valve. Since this valve was designed to reopen, some more gas was released before it was permanently closed.

A total of just under 40kg of gas was released, with a maximum rate of 0.11kg/s. No ignition or personal injuries occurred. The process technician scheduled to carry out the test was not in the immediate vicinity of the hose and was not directly exposed to the incident.

Causes

Direct cause

The half-inch hose used for bleed-off was incorrectly connected.

Underlying causes

- Procedures and work descriptions failed adequately to cover all critical elements in the job.
- Preparatory activities were not all covered in the isolation plan.
- The hose was unnecessarily subject to gas under pressure.
- Inadequate verification before the system was pressurised.

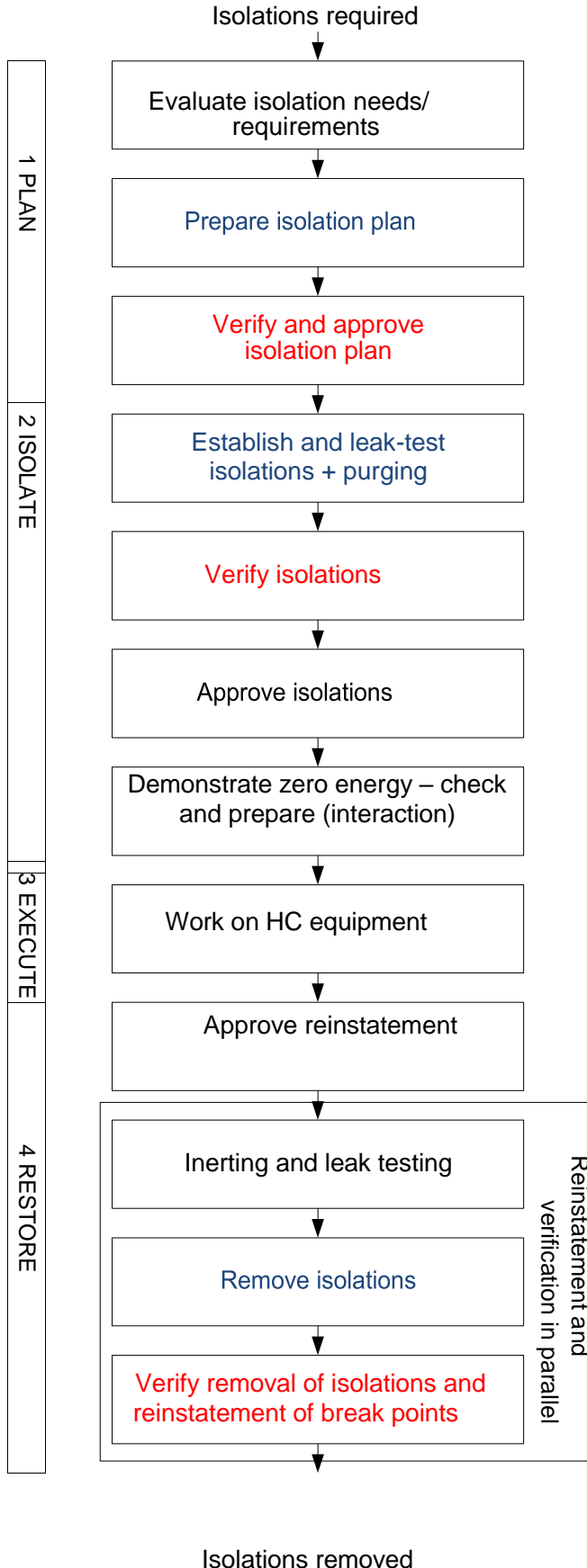
Lessons and recommendations

- Revise test procedures to ensure that the bleed-off segment is isolated.
- Ensure that all exposed parts of the plant are adequately covered by leak testing.
- Strengthen the use of management verification.
- Limit or avoid exposure of hoses to pressure when they are not part of the test.

Key:

Blue and red text indicates roles intended to function as independent ones

Status for stages in best practice document




KEY:

- 1 Carried out, functioned as intended
- 2 Carried out, but failed
- 3 Not carried out
- Not known whether carried out

Status during the incident

- 1 Carried out, with approved non-conformity from isolation requirements.
- 2 Carried out, general isolation plan for all wells. Lacked details for leak testing and reinstatement.
- 2 Carried out, general isolation plan for all wells. Lacked details for leak testing and reinstatement.
- 1 Carried out as planned.
- 1 Carried out.
- 3 Not carried out, no requirement for approval before reinstating break points.
- 1 Carried out.
- 1 Carried out.
- 3 Not carried out, no requirement for approval before reinstatement.
- 2 No overview of valve status when leak-testing, not described in isolation plan or purging with air before testing.
- 2 Forgot to close bleed-off to a safe area.
- 3 Not carried out.

 Gas leak when repressurising annulus – 0.11kg/s, eight minutes.