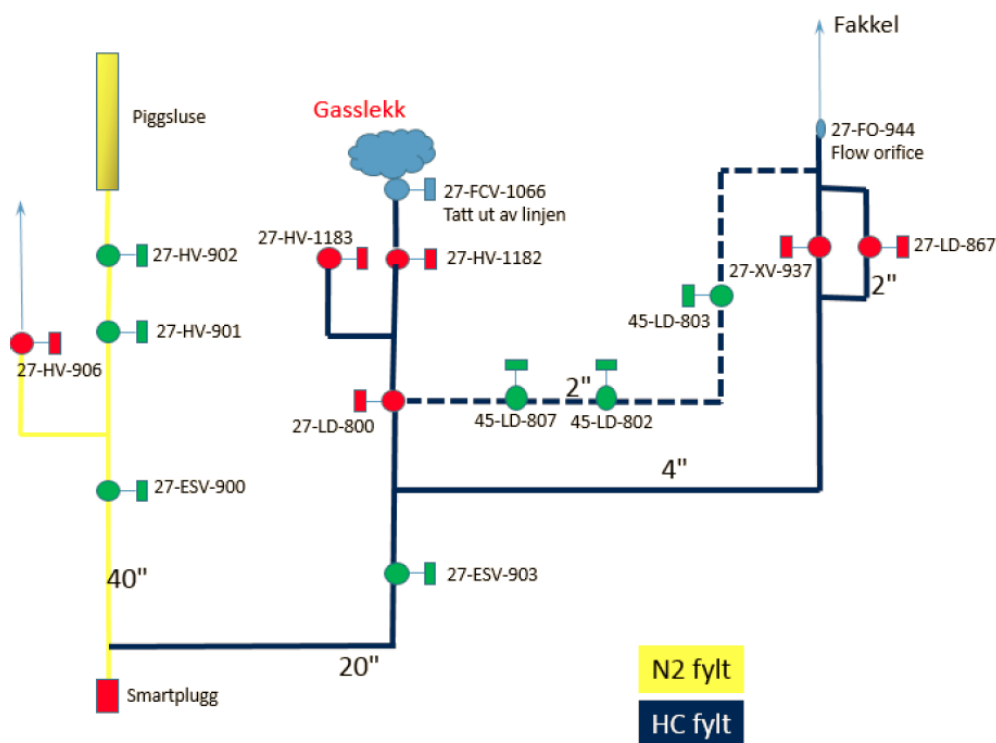


Incident description: gas leak 2017

In preparation for major maintenance on the platform, the process plant was to be rendered gas-free by implementing an isolation plan. Plans called for an emergency shutdown (ESD) valve to be used as a barrier for the bypass job after a known leak in the valve had been repaired. During planning of the work, another solution was chosen which utilised two isolation plans (valve and blind lists). This would allow part of the work to start earlier than planned. However, the two new lists overlapped because several of the valves in the process area were included in both, but with opposite valve positions. The result was that one of the valves intended to serve as a barrier in the one V&B list was opened when the other list was set. This led to a gas leak in the order of 0.6kg/s, which lasted for 111 seconds to yield a total quantity of 69kg.



Ventilenes plassering og status forut for hendelsen

Causes

Direct causes

- Changes in the order of the jobs were not known to the whole organisation, and obtaining a complete overview was difficult.
- Assumptions in V&B lists were changed by altering bleed from 27-LD-800 to the flare system without adequate risk assessments in relation to other activities.
- Differences in understanding what the function of barrier valve 27-HV-1182 was. Not tested under low pressure.
- Two V&B lists (148833 and 144403) which overlapped but which had valves in opposite positions.

Underlying causes:

- Inadequate follow-up/control of the work.

- Unclear to the organisation how far the procedure for smart-plug setting governed the operation. Checklists for the procedure were not signed out.
- Failure to notice that 27-HV-1182 could leak with low or no pressure difference over the valve.
- Responsibilities and division of roles between units was unclear.
 - Organising a maintenance shutdown was new to the organisation. New people and roles to relate to.
- The team did not observe rules/procedures/good work practice.
 - V&B list 148833 (work on 27-FCV-1066)
 - The list was finished on 13 June, verified, approved and signed the same day. The checklist was signed two days later. This is supposed to be signed and reviewed before the V&B list is approved.
 - The change log was not updated when changing the isolation plan. New checklists were not signed and approved, and the old lists continued to be used.
 - V&B list 144403 (work on 27-ESV-903)
 - Setting barriers began on 17 June, but the list was not signed and approved until the following day.
 - The checklist was filled in the day after the V&B list was approved. This should be done before the V&B list is approved.
- Inadequate risk assessment/faulty assessment of the hazard potential
 - The changes made to V&B list 148833 meant that three valves had the opposite position to that specified in V&B list 144403.

Lessons and recommendations

- Ensure expertise is available on valves, how they work and their functions.
 - Particular focus on valves included in shutdown plans.
 - Precondition for a sealed barrier valve with a given design.
- Define clear roles in both planning and execution of maintenance shutdowns.
- Ensure common understanding of which procedures govern the operation, compliance with these, and signing of associated checklists.
- Ensure that plans are complied with, and take decisions sufficiently early for the organisation to have enough preparation time.
- Ensure good management and documentation of risk assessments in the event of changes.
- Compliance with internal company requirements for work on normally pressurised systems.
 - Preparation of and compliance with signed checklists and isolation plans.
 - Verification of isolation plans.
 - Use of change logs.
- Increase awareness of the need to comply with internal company requirements concerning work permits and safe job analyses.
- Ensure systematic use of and quality in handovers at all levels.
 - Ensure that important information is made known to all shifts.