

Findings of an inspection campaign on storage and unloading facilities for gaseous hydrogen

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Introduction



- Inspection health & safety
- Specific service for lower/upper tier Seveso Sites
- Publications Belgian inspections services Seveso Sites
 - Organisational topics
 - Technical topics
 - Published in Dutch/French



Scope inspection campaign (2021-2023)

- Inspection campaign 2021 – 2023
- Upper and lower tier Seveso sites (19 sites)
- Production sites of H2 and users of H2
- Checklist
 - Storage : fixed storage and mobile storage (tube trailers and bottle racks)
 - Pipelines
 - Unloading facilities (unloading of tube-trailers on site)
 - Filling of gasbottles
 - Compressors
- One site loading station for tube-trailers (not in campaign)



Scope inspection campaign (2021-2023)

- Each chapter looks to risks and measures:
 - Process Risks
 - Degradation Risks
 - Preventing Leaks
 - Distribution of leaks
 - Explosion Risks
 - Measures against damage due to fire
 - Protection of people
 - Intervention



Findings



- Most installations are outdoor
- Large compressors are indoor due to noise
- Old (~1970) and new (~2019) installations
- Hydrogen installations seen as a small risk compared to other risks on site
- Sometimes (part of) hydrogen installations are owned/designed by third parties :
 - Minor knowledge of the hydrogen installations by the exploitant
 - Quality of risk analysis (missing ownership)



Findings



- Safety valves:
 - Identification of overpressure scenario's incomplete
 - Missing calculations of capacity of safety valves
- Lacks in inspection programs (pressure relief valves, pipelines, interlocks...)
- Fire resistant valves?
- Fire resistant gaskets?



Findings

- Areas with risk for explosions identified
- Work permit systems
- (Periodic) inspections on electrical equipment (change in frequencies)
- Antistatic shoes and clothing
- Indication of risks (open fire, EX,...)
- Differences in emergency buttons for tube-trailers



Findings



- Gasdetectors:
 - Outdoor
 - Indoor (compressors)
- Fire detectors
- Large differences in emergency planning resources:
 - Deluge systems
 - Automatic emergency valves
 - Fire hydrants/water monitor
- Emergency plan → sometimes missing intervention scenario for H2 leak/fire



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Findings

















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