

Case Study Austria

Confusion of Chemicals

TWG2, September 2018

Facts of the Case

- On 13 December, during a maintenance shutdown in an establishment producing corn starch a major accident occurred
- Various chemicals are delivered to the site with railroad tankers
- Caustic soda was erroneously filled into a tank with hydrochloride acid
- 600 kg of chlorine were produced and formed a toxic cloud
- A forklift driver was very seriously hurt when driving through the toxic cloud
- Some 40 people needed medical assistance
- 200 persons evacuated



Circumstances

- Hydrochloride acid was expected to arrive already the day before and was very urgently needed
- Instead of this acid a railroad tanker containing caustic soda was brought to the filling place
- The existing operating procedure requires to take a sample and analyse it (pH measurement)
- No reliable technical measure in place
- Operator carried out the analyse and nevertheless he connected the tanker to the wrong piping leading to the tank containing hydrochloride acid
- Pumping was terminated by the operator after noticing that something must be wrong
- Operator very experienced, many years carrying out these kind of activities

Reason for misbehaviour

- Maybe the operator was so convinced that hydrochloride acid was delivered that he ignored the result of analysis
- Maybe no real analysis happened, only an entry in the protocol was made
- Maybe no real sample was taken but a prepared cup with the substance was used (there were small cups with different liquids found in the lab)

Measures taken

- Inspectorate in Upper Austria delivered a letter to all Seveso-operators stating that a new “state of the art” for loading and unloading dangerous substances where a confusion of chemicals may lead to a serious danger will be regarded as appropriate
- No longer possible to use organisational measures only
- Additionally it is required to have technical measures in place
- Technical measures (e.g. density or pH measuring) with appropriate functional safety level (SIL)
- These technical measures must stop automatically the filling procedure before the wrong substance reaches the tank