

Explosion på en kemikalie fabrik

Start datum 991112

Händelse kod: DE/1999/009-[01]

Kort rapport

Typ av händelse

Gasexplosion skedde i en gasblandningskärl.

Inblandade ämnen

Toluol (Toluen, CAS nr. 108-88-3)

Olycksobjekt

Dagen som händelsen inträffade på släpptes 12 ton processvatten ut och behandlades med 150 kg järnklorid (FeCl_3) i svavelsyra (60 %), med pH-värde 2.5-3.0. pH-värdet kontrollerades med ett manuellt taget prov Efter det tredje provet var pH-värdet 2.9. Operatören bestämde sig för att utföra ett sista prov efter en kort tid för att garantera ett stabilt pH-värde. Enligt analys av skada, inträffade en explosion i gasblandningen. Väteperoxid 35 % som skulle ha matats in efter att man mätt pH-värde, hade fortfarande inte blivit adderad på grund av att det manuella pH-testet inte hade blivit beräknat.

Olycksorsak

Enligt analys av skada, inträffade en explosion i gasblandningen.

Skador

De materiella skadorna beräknades till ca: 2 000 000 DM – 1 000 000 EURO.

Akutåtgärder

Processdatorn aktiverade stängningsprogrammet för den berörda enheten. Larmsignalen gick och byggnaden evakuerades. Räddningstjänsten larmades.

Erfarenheter

Den förberedande behandlingen av avloppsvatten kommer att samlas i kärl.

English summary

Start date: 12/11/1999

Accident code: DE/1999/009-[01]

Accident type(s)

Explosion in the gas space of the mixing vessel

Substance(s) directly involved

Toluol (Toluene, C.A.S. No: 108-88-3).

Immediate source(s) of accident

The day of the event, 12 tons of process water effluents from a receiver were transferred into a mixing vessel and treated with 150 kg of solid iron chloride (FeCl₃) in sulphuric acid (60%), setting pH 2.5-3.0. The pH was controlled by taking a sample with a manual sampler and tested with a portable pH testing equipment externally to the vessel.

After the third test, the pH was at 2.9, corresponding to default parameters. The operator in charge decided to perform a last test after a short stirring time, in order to guarantee a stable pH value.

According to the analysis of the damage, an explosion occurred in the gas space of the mixing vessel (the presence of a highly flammable liquid in the mixing vessel must have formed an explosive vapour-air mixture in the gas space of the vessel). The explosion fatally injured the operator in charge, standing in front of the opened manhole.

Hydrogen peroxide 35%, which according to operating instructions had to be fed in after setting the pH value, had still not been added due to the fact that the manual pH test had not been concluded.

Suspected cause(s)

According to the analysis of the damage, an explosion occurred in the gas space of the mixing vessel (the presence of a highly flammable liquid in the mixing vessel must have formed an explosive vapour-air mixture in the gas space of the vessel). The explosion fatally injured the operator in charge, standing in front of the opened manhole.

Immediate effects

The explosion fatally injured the operator in charge, standing in front of the opened manhole. Material damages are estimated at ca. 2.000.000 DM - 1.000.000 EURO.

Emergency measures taken

The process control computer activated the emergency shutdown program for the installation section concerned.

On-site alarm was raised and the building evacuated.

The on-site fire brigade, the sanitary service and the emergency response service were alerted.

Immediate lessons learned

The preliminary treatment of sewage water will be carried out in a purged vessel.

Raw materials are fed into a closed system.

Sampling will not be performed any more on an open vessel.