

Brand på en kemikaliefabrik

Start datum:980731

Händelse kod: DE/1998/010-[02]

Kort rapport

Typ av händelse

Branden inträffade i en värmepanna på en krackningsanläggning.

Inblandade ämnen

Lättantändig vätska (Nafta, CAS nr:8030-30-06)

Olycksobjekt

Den 31 juli 1998 inträffade en brand i en värmepanna på en krackningsanläggning, i vilken nafta släpptes ut till omgivningen omkring en distributionsstation, där eld uppstod när det kom i kontakt med en krackervärmepanna. Räddningstjänsten var på plats för att bekämpa elden och fick uppdrag att reducera temperaturen i ej brinnande del av installationen. Det fattade eld i en del av installation men detta upptäcktes och isolerades. De beslutade att låta nafta brinna ut under kontroll, därför användes kväve att pressa ut resterande nafta från utrustningen. Händelseorsaken var troligen reparationsarbete av krackervärmepanna. För att rensa ut de brinnande resterna inuti av krackningsröret stängdes den mindre krackningsvärmepannan i 60 dagar, Koks har då blivit till CO2 igenom kontrollerad utfordring av vattenånga och luft i krackningsrören. Innan operationen måste krackningsrören tömmas fullständig för att ta bort kolväterester. För att göra detta måste man stänga ventilen och placera stansningsplatta inne i värmepannan. I detta fall betraktas den som strömbrytare till värmepannan. Arbetet genomfördes av en stor grupp. Stansningsplattan placerades inne av kontrollrummet. I början följde gruppen sekvenser av proceduren som krävs vid operationen. Hur utsläppet har inträffat: Den utsläppta överhettade vätskan tog snabbt eld inom ett par sekunder och kom i kontakt med värmepanna.

Olycksorsak

Inkorrekt placering av stansningsplatta, mänskligt fel (under reparationsarbete)

Skador

Två arbetare skadades och vårdades på sjukhus.
Reparationskostnaden beräknades över 10.000.000 DM, 5000.000 euro.

Akutåtgärder

Erfarenheter

Standard stansningsplatta användes i samband med händelsen. Dessutom skall manometer bli installerad, såvida en extra möjlighet för personalen att kontrollera systemet som är inte under tryck.

English summary

Start date: 31/07/1998

Accident code: DE/1998/010-[02]

Accident type(s)

Fire involving a furnace section of a steam cracker.

Substance(s) directly involve

Flammable liquids (Naphtha, C.A.S. No: 8030-30-6).

Immediate source(s) of accident

31/07/98: a fire developed in a furnace section of a steam cracker.

Naphtha, which had been released into the environment near a distribution station, caught fire after contact with an operating cracker furnace.

The on-site emergency team fought the fire and took measures to reduce the temperature of not burning adjoining parts of the installation. After the part of the installation affected had been identified and isolated, it was decided to let the naphtha burn out under control, while nitrogen was used to push out the residual naphtha from the equipment.

The cause of the event was probably linked to maintenance works on a cracking furnace.

In order to clean out the coke deposited inside the cracking tubes as a consequence of the reaction mechanisms, the smaller cracking furnaces have to be shut-down every 60 days. The coke is then burnt into CO₂ through controlled feeding of water vapour and air into the cracking tubes.

Before this operation, the cracking tubes must be thoroughly flushed to remove any hydrocarbon residues, after which the cracking tubes must be safely separated from the naphtha system. To do this, besides shutting off the valves, blanking plates are placed in the inlets of the furnace.

In the case being considered, this switchover of furnaces was being carried out. A team carried out the required work. A blanking plate plan in the control room documents the extraction and the placing of blanking plates.

In the beginning, the team correctly followed the sequence of procedures required by the operating instructions and the plan. However, it appears that the release occurred, a blanking plate from a nearby pressurised naphtha pipe was extracted instead of a blanking plate from the pipe leading to the furnace which had to be decoded. The released overheated liquid vaporised spontaneously and caught fire within a few seconds upon contact with an adjacent furnace.

Suspected cause(s)

Incorrect placing of blanking plate, human error (during maintenance works)

Immediate effects

Two persons were treated as outpatients, while two more were treated as in-patients in a hospital.

According to preliminary approximations, the repair costs amount to over 10.000.000 DM -5.000.000 Euro.

Emergency measures taken

The on-site emergency response team fought the fire and took measures to reduce the temperature of the not burning adjoining parts of the installation. After the concerned section had been identified and isolated, it was decided to let the naphtha burn away under control, while nitrogen was used to push out the residual naphtha from the equipment.

Immediate lessons learned

Standard spectacle blanking plates will be mounted instead of the fast-exchange blanking plates used in the context of the incident.

Moreover, manometers are going to be installed in evidence close to the blanking plates, providing a supplementary possibility for the personnel to check that the system is not under pressure.