

Explosion på en depå för kolväten (LPG).

960719 MARS 1996_07

Butan släpptes ut från en 6 tums rörledning under en tank med 6000 m3 butan. Utsläppet uppstod på grund av en öppen ventil. Butan samlades i kondenserad form i en stor pöl under tanken. Ett butanmoln bildades och antändes när det nådde en tändkälla 200 m bort. En stötvåg såväl som en termisk strålningsfront uppstod. Fönster krossades 120 m bort. Efter explosionen antändes den kvarvarande butanen tillsammans med allt som släppts ut ur tanken. Branden släcktes efter en timme med hjälp av skum. Eftersläckningsarbetet omfattade ett antal småbränder som uppstått på området.

Inblandade ämnen och mängder

	CAS Nr.	Mängd
butan	106-97-8	30 ton

Skador:

Människor:	1 person avled av de brännskador han ådrog sig vid explosionen. Ytterligare 17 personer skadades. Av dessa brännskadades 1 svårt, medan 4 skadades vid explosionen.
Materiella:	Avsevärda skador på anläggningen, men även utanför fabriksområdet till följd av stötvågen.
Miljö/ekologi:	Inga effekter rapporterade.
Infrastruktur:	Vägar i området spärrades av.

Erfarenheter redovisade (Ja/Nej): Nej

Report Profile

Identification of Report:

country: FA ident key: 1996_007_01

reported under Seveso I directive as major accident reports: SHORT

Date of Major Occurrence: Time of Major Occurrence

start: 1996-07-19 start: 08:34:00

finish: 1996-07-19 finish: 11:25:00

Establishment:

name:

address:

industry: - not applicable -

LPG Distribution

Seveso II status: not applicable: Yes art. 6 (notification): No

art. 7 (MAPP): No

art. 9 (safety report): No

Date of Report:

short: full:

Authority Reporting:

name:

address:

Authority Contact:

rep_cont_name:

rep_cont_phone:

rep_cont_fax:

Additional Comments:

a) - not applicable -

b) - not applicable -

c) - not applicable -

d) - not applicable -

e) - not applicable -

Short Report

country: FA **ident key:** 1996_007_01

Accident Types:

release: Yes **explosion:** Yes

water contamination: No **other:** No

fire: Yes

description:

Release of liquefied butane (LPG) from a 6" pipe under an empty spherical tank of 6000 m3 due to the opening of a valve, with the consequent constitution of a pool which evaporated forming a flammable cloud which deflagrated when it reached... see Appendix Short Report / description of accident types

Substance(s) Directly Involved:

toxic: No **explosive:** Yes

ecotoxic: No **other:** No

flammable: Yes

description:

The substance involved is commercial butane, the CAS number of which is 106-97-8, it is not clear what amount was involved. The first data from the company indicated 70 tons of which 30 were released before the fire (ignition of the cloud),... see Appendix Short Report / description of substances involved

Immediate Sources of Accident:

storage: Yes **transfer:** Yes

process: No **other:** No

description:

The plant in which the accident occurred has as principal activity the loading, unloading, storage, transfer, filling of LPG cylinders, and the maintenance of the cylinders. The global capacity of the plant is 31000 m3, distributed in tanks... see Appendix Short Report / description of immediate sources

Suspected Causes:

plant or equipment: Yes **environmental:** No

human: No **other:** No

description:

Currently, the hypothesis is that the valve connecting the pipe (opening to the air) with the rack of pipe opened spontaneously, or that the accident cause was a failure of the control mechanism of the valve.

Immediate Effects:

material loss: Yes

human deaths: No

human injuries: Yes **community disruption:** No

other: No

ecological harm: No

national heritage loss: No

description:

The effects are mostly due to radiation and overpressure, caused by the deflagration, apart from the structures affected within the cloud at the moment of the explosion, 18 persons were affected, of which 3 were particularly affected by rad... see Appendix Short Report / description of immediate effects

Emergency Measures taken:

on-site systems: Yes **decontamination:** No

external services: No **restoration:** No

sheltering: No **other:** No

evacuation: Yes

description:

On the one hand, the on-site emergency plan of the company was activated, which foresaw the evacuation and the activation of different safeguards, like refrigeration systems of the tanks, some of which failed. On the other hand, the off-sit... see Appendix Short Report / description of emergency measures taken

Immediate Lessons Learned:

prevention: Yes **other:** No

mitigation: Yes

description:

- not applicable -

Appendices for the FA / 1996_007_01 report

Appendix Short Report / description of accident types:

Release of liquefied butane (LPG) from a 6" pipe under an empty spherical tank of 6000 m3 due to the opening of a valve, with the consequent constitution of a pool which evaporated forming a flammable cloud which deflagrated when it reached the ignition source some 200 m away, producing a pressure wave and a thermal radiation wave (UVCE), causing different effects, among others also one fatality. After the deflagration of the cloud, the pool and the product released from the pipe caught fire, which could be extinguished only after an hour, also a series of repetitive fires spread all over the plant.

Appendix Short Report / description of substances involved:

The substance involved is commercial butane, the CAS number of which is 106-97-8, it is not clear what amount was involved. The first data from the company indicated 70 tons of which 30 were released before the fire (ignition of the cloud), which corresponds to a major accident scenario.

Appendix Short Report / description of immediate sources:

The plant in which the accident occurred has as principal activity the loading, unloading, storage, transfer, filling of LPG cylinders, and the maintenance of the cylinders. The global capacity of the plant is 31000 m3, distributed in tanks of 6000 m3, 2000 m3, 1000 m3, 200 m3 and 100 m3. The release originated in the input line of one of the 6000 m3 spherical tanks which was filled with nitrogen because of maintenance operations. The pipe opening to the air was of 6".

Appendix Short Report / description of immediate effects:

The effects are mostly due to radiation and overpressure, caused by the deflagration, apart from the structures affected within the cloud at the moment of the explosion, 18 persons were affected, of which 3 were particularly affected by radiation and 4 by overpressure. The most seriously affected were two burnt workers, who were at about 50 - 70 metres distance in a straight line from the spreading fire (flare, flashing flame), one of which died as a consequence of the burns. Damages to nearby buildings, the filling station building with serious structural damages, office rooms with cracks in the walls of 100 metres, ruptured windows at 120 metres distance from the company, rupture of asbestos panels (Eternit = panels of asbestos cement or similar used for roof covering) at 150 m distance from the company, rupture of roof coverings at 150 m, throwing of debris up to 300 m.

Appendix Short Report / description of emergency measures taken:

On the one hand, the on-site emergency plan of the company was activated, which foresaw the evacuation and the activation of different safeguards, like refrigeration systems of the tanks, some of which failed. On the other hand, the off-site emergency plan was activated, which meant for the public officers blocking the access of an area of 350 m around the company and the evacuation of the companies in this area.