

Brand på en krackningsanläggning i petrokemisk industri.

890708 MARS 1989_04

Vid rutinmässig drift på en krackningsanläggning brast ett rör, troligen på grund av materialtrötthet. Detta ledde till ett strömbrott vilket automatiskt försatte fabriken i ett stand-by tillstånd, där strömförsörjning och inflöden stängs av. Anläggningen kylde gradvis ned. Efter ungefär en halvtimme bröt en brand ut av okänd anledning. Företagets interna brandkår och räddningstjänsten samarbetade i släckningsarbetet. Angränsande tankar kylde med vatten och kranar och ventiler stängdes på olika delar av anläggningen för att förebygga spridning av branden. Släckningsvattnet samlades upp och skickades till anläggningens reningsverk. Kontinuerliga mätningar av halter i luften utanför fabriksbyggnaden visade inte på några problem.

Inblandade ämnen och mängder

	CAS Nr.	Mängd
diverse brännbara ämnen		totalt ca 10 000 kg
metan	74-82-8	
toluen	108-88-3	
bensen	71-43-2	
väte	1333-74-0	

Skador:

Människor:	Inga.
Materiella:	Anläggningen skadades,
Miljö/ekologi:	Inga effekter rapporterade.
Infrastruktur:	Inga.

Erfarenheter redovisade (Ja/Nej): Nej

Report Profile

Identification of Report:

country: FA ident key: 1989_004_01

reported under Seveso I directive as major accident reports: SHORT+FULL

Date of Major Occurrence: Time of Major Occurrence

start: 1989-07-08 start:

finish: finish:

Establishment:

name:

address:

industry: 2002 petrochemical, refining, processing

Petrochemical (Plant for Further Processing of Crude Cracked Gasoline)

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: 1989_004_01

Accident Types:

release: Yes explosion: No

water contamination: No other: No

fire: Yes

description:

ACCIDENT CASE HISTORY DESCRIPTION:... see Appendix Short Report / description of accident types

Substance(s) Directly Involved:

toxic: No explosive: Yes

ecotoxic: No other: No

flammable: Yes

description:

The whole amount of flammable substances (hydrogen, methane, toluene and benzene) involved in the accident has been estimated in about 10,000 Kg but no data are available about their single amounts.... see Appendix Short Report / description of substances involved

Immediate Sources of Accident:

storage: No transfer: No

process: Yes other: No

description:

The accident occurred during normal operation in a plant for further processing of crude cracked gasoline of a petrochemical industry.

Suspected Causes:

plant or equipment: Yes environmental: No

human: No **other:** No

description:

CAUSES:... see Appendix Short Report / description of suspected causes

Immediate Effects:

material loss: Yes

human deaths: No

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

other: No

ecological harm: No

national heritage loss: No

description:

MATERIAL LOSS:... see Appendix Short Report / description of immediate effects

Emergency Measures taken:

on-site systems: Yes **decontamination:** Yes

external services: Yes **restoration:** No

sheltering: No **other:** No

evacuation: No

description:

INSIDE THE ESTABLISHMENT:... see Appendix Short Report / description of emergency measures taken

Immediate Lessons Learned:

prevention: No **other:** Yes

mitigation: No

description:

To be defined after material investigations will be concluded.

A Occurrence Full Report

country: FA **ident key:** 1989_004_01

1 Type of Accident

remarks: Due to the rupture of a pipe (probably because of material failure), a power failure occurred and the plant was automatically put in hot-stand-by mode (feed and energy supply automatically cut out). The plant was gradually cooled down. Aft... see Appendix Full Report A / type of accident

2 Dangerous Substances

remarks: The total establishment and the potential directly involved inventories of hydrogen, methane, benzene and toluene refer to the whole amount involved in the accident (it had been estimated in about 10,000 Kg). No data are available about the... see Appendix Full Report A / dangerous substances

3 Source of Accident

illustration: - not applicable -

remarks: The accident occurred during normal operation in a plant for further processing of crude cracked gasoline (code 3102) of a petrochemical industry (code 2002). This industry included also an alkylation process unit. The component involved wa... see Appendix Full Report A / source of accident - remarks

4 Meteorological Conditions

precipitation none: fog: rain: hail: snow:

No No No No No

wind speed (m/s):

direction (from):

stability (Pasquill):

ambient temperature (°C):

remarks: - not applicable -

5 Causes of Major Occurrence

main causes

technical / physical 5101 operation: vessel/container/containment-equipment failure

5501 other: not identified

- not applicable -

- not applicable -

- not applicable -

human / organizational - not applicable -

- not applicable -

- not applicable -

- not applicable -

- not applicable -

remarks: The rupture of the pipe was probably due to material failure (code 5101). No information

are available about the development of the fire at the outlet of the alkylation reactor

because when the Original Report was prepared material investig... see Appendix Full

Report A / causes of major occurrence

6 Discussion about the Occurrence

- not applicable -

Type of Accident country: FA ident key: 1989_004_01

event:

major occurrence 1202 fire: pool fire (burning pool of liquid, contained or uncontained)

initiating event 1202 fire: pool fire (burning pool of liquid, contained or uncontained)

associated event - not applicable -

Dangerous substances

country: FA ident key: 1989_004_01

a) total establishment inventory

CAS number: 108-88-3 identity: Toluene

name from Seveso I Directive: - not applicable -

name from Seveso II Directive: - not applicable -

category from Seveso II: - not applicable -

other hazards (1): - not applicable -

other hazards (2): - not applicable -

maximum quantity (tonnes): 10

use of substance as: NORMAL FINISHED PRODUCT

b) substance belongs to relevant inventory directly involved: Yes

actual quantity: 10 potential quantity: 10

c) substance belongs to relevant inventory indirectly involved: No

actual quantity: -1 indir_pot_quant: -1

a) total establishment inventory

CAS number: 74-82-8 identity: Methane

name from Seveso I Directive: - not applicable -

name from Seveso II Directive: - not applicable -

category from Seveso II: - not applicable -

other hazards (1): - not applicable -

other hazards (2): - not applicable -

maximum quantity (tonnes): 10

use of substance as: NORMAL FINISHED PRODUCT

b) substance belongs to relevant inventory directly involved: Yes

actual quantity: 10 potential quantity: 10

c) substance belongs to relevant inventory indirectly involved: No

actual quantity: -1 indir_pot_quant: -1

a) total establishment inventory

CAS number: 1333-74-0 identity: Hydrogen

name from Seveso I Directive: - not applicable -

name from Seveso II Directive: - not applicable -

category from Seveso II: - not applicable -

other hazards (1): - not applicable -

other hazards (2): - not applicable -

maximum quantity (tonnes): 10

use of substance as: NORMAL FINISHED PRODUCT

b) substance belongs to relevant inventory directly involved: Yes

actual quantity: 10 potential quantity: 10

c) substance belongs to relevant inventory indirectly involved: No

actual quantity: -1 indir_pot_quant: -1

a) total establishment inventory

CAS number: 71-43-2 identity: Benzene

name from Seveso I Directive: - not applicable -

name from Seveso II Directive: - not applicable -

category from Seveso II: - not applicable -

other hazards (1): - not applicable -

other hazards (2): - not applicable -

maximum quantity (tonnes): 10

use of substance as: NORMAL FINISHED PRODUCT

b) substance belongs to relevant inventory directly involved: Yes

actual quantity: 10 potential quantity: 10

c) substance belongs to relevant inventory indirectly involved: No

actual quantity: -1 indir_pot_quant: -1

Source of Accident - Situation country: FA ident key: 1989_004_01

situation

industry

initiating event 2002 petrochemical, refining, processing

associated event - not applicable -

activity/unit

major occurrence 3102 process: chemical continuous reaction

initiating event 3102 process: chemical continuous reaction

associated event - not applicable -

component

major occurrence 4002 reaction vessel; pressurised

initiating event 4002 reaction vessel; pressurised

associated event - not applicable -

B Consequences Full Report

country: FA ident key: 1989_004_01

1 Area concerned

affected

extent of effects installation: Yes

establishment: Yes

off-site; local: No

off-site; regional: No

off-site; transboundary: No

illustration of effects - not applicable -

remarks In the Original Report there is no evidence of significant effects outside the e... see Appendix

Full Report B / area concerned - remarks

2 People

establishment popul. emergency personnel off-site population

total at risk

immediate fatalities

subsequent fatalities

hospitalizing injuries

other serious injuries

health monitoring

remarks No people were injured during the accident.

3 Ecological Harm

pollution/contamination/damage of:

- **residential area (covered by toxic cloud)** Suspected

- **common wild flora/fauna (death or elimination)** Suspected

- **rare or protected flora/fauna (death or elimination)** Suspected

- **water catchment areas and supplies for consumption or recreation** Suspected

- **land (with known potential for long term ecological harm or** Suspected

preventing human access or activities)

- **marine or fresh water habitat** Suspected

- **areas of high conservation value or given special protection** Suspected

remarks In the Original Report there is no evidence of significant ecological harms.... see Appendix

Full Report B / ecological harm

4 National Heritage Loss

effects on:

- **historical sites** not applicable - **historic monuments** not applicable

- **historic buildings** not applicable - **art treasures** not applicable

remarks No data available.

5 Material Loss

establishment losses off site losses

costs (direct costs to operator) (social costs)

in ECU DM ECU DM

material losses 3500000

response, clean up, restoration

remarks The accident caused damages inside the establishment. The cost of the material d... see Appendix

Full Report B / material loss

6 Disruption of Community Life

establishment/plant evacuated disabled/unoccupiable destroyed

- **nearby residences/hotels** No No No

- **nearby factories/offices/small shops** No No No

- schools, hospitals, institutions No No No

- other places of public assembly No No No

interruption of utilities etc. no / yes duration

- gas No

- electricity No

- water No

- sewage treatment works No

- telecommunications No

- main roads No

- railways No

- waterways No

- air transport No

significant public concern none local level national level

- off site populations Yes No No

- media interest No No No

- political interest No No No

remarks In the Original Report there is no evidence of significant effects outside the e... see Appendix

7 Discussion of Consequences

C Response Full Report

country: FA ident key: 1989_004_01

1 Emergency Measures

taken - on site - not applicable - - not applicable -

- not applicable - - not applicable -

- not applicable - - not applicable -

- **off site** - not applicable - - not applicable -

- not applicable - - not applicable -

- not applicable - - not applicable -

still - on site - not applicable - - not applicable -

required

- not applicable - - not applicable -

- not applicable - - not applicable -

- **off site** - not applicable - - not applicable -

- not applicable - - not applicable -

- not applicable - - not applicable -

continuing contamination or danger

-**on site** not applicable

-**off site** not applicable

remarks - not applicable -

2 Seveso II Duties

pre-accident evaluation

Article item not due yet not done done/submitted evaluated

6 notification No No No No

7 policy (MAPP) No No No No

9 safety report No No No No

9, 10, 11 update No No No No

11 internal plan No No No No

11 external plan No No No No

13 informing public No No No No

9, 12 siting policy No No No No

post-accident evaluation

Seveso II duty was actual were actual compared with actual

contingency consequences consequences, the

addressed? addressed? predicted extent was?

Article item

7 policy (MAPP) not applicable not applicable not applicable

9 current safety report not applicable not applicable not applicable

11 internal plan not applicable not applicable not applicable

11 external plan not applicable not applicable not applicable

13 informing public not applicable not applicable not applicable

9, 12 siting policy not applicable not applicable not applicable

evaluation of safety organisation

organisational element element existed did element relate to actual circumstances of

yes / no no / partly / yes adequate?

- written policy objectives No

- specified management No

structure

- specified responsibilities No

- specified working procedures No

- specified procedures for No

assessment/auditing of

management system

- specified procedures for No

review and update of

management policy

- specified general training No

procedures

- specified emergency No

training procedures

evaluation of ecological impact control

organisational element element existed did element relate to actual circumstances of

yes / no no / partly / yes adequate?

- ecological status review No

before incident

- potential ecological No

consequences assessment

- ecological impact review No

after incident

- ecological restoration No

procedures

- subsequent review of No

restoration success

remarks - not applicable -

3 Official Action Taken

legal action

- not applicable -

other official action

- not applicable -

4 Lessons Learned

measures to prevent recurrence

To be defined after material i... see Appendix Full Report C / lesson learned - prevent

measures to mitigate consequences:

- not applicable -

useful references:

- not applicable -

5 Discussion about Response

- not applicable -

Appendices for the FA / 1989_004_01 report

Appendix Short Report / description of accident types:

ACCIDENT CASE HISTORY DESCRIPTION:

Due to the rupture of a pipe (probably because of material failure), a power failure occurred and the plant was automatically put in hot-stand-by mode (feed and energy supply automatically cut out). The plant was gradually cooled down. After about half an hour, for reasons not yet clarified, a fire started at the outlet of the alkylation reactor. The fire was extinguished by the intervention of operators, the plant fire brigade and the local fire brigade. The fire fighting water was collected in a basin and disposed for treatment in the biological waste-water treatment plant of the establishment. Ambient air monitoring revealed no presence of hazardous substances in the environment.

Appendix Short Report / description of substances involved:

The whole amount of flammable substances (hydrogen, methane, toluene and benzene) involved in the accident has been estimated in about 10,000 Kg but no data are available about their single amounts.

- Methane (C.A.S. CODE: 74-82-8, E.E.C. CODE: 601-001-00-4).

- Toluene (C.A.S. CODE: 108-88-3).

- Benzene (C.A.S. CODE:71-43-2, E.E.C. CODE: 603-003-00-0).

- Hydrogen (C.A.S. CODE:1333-74-0, E.E.C. CODE:001-001-00-9).

Appendix Short Report / description of suspected causes:

CAUSES:

The rupture of the pipe was probably due to material failure. No information are available about the development of the fire at the outlet of the alkylation reactor because when the Original Report was prepared material investigations were still in progress.

Appendix Short Report / description of immediate effects:

MATERIAL LOSS:

The accident caused damages inside the establishment. The cost of the material damages has been estimated in about 2`5 millions of Deutch Marcs (about 1`2.5 MECU).

Appendix Short Report / description of emergency measures taken:

INSIDE THE ESTABLISHMENT:

The emergency depressurization of the plant was activated. In order to minimize the amount of flammable substances involved, the isolation of various sections of the plant was carried out. Nitrogen purging of the system was carried out. The adjacent installations were protected by applying cooling water. The fire was extinguished by the intervention of operators, the plant fire brigade and the local fire brigade. The fire fighting water was collected in a basin and disposed for treatment in the biological waste-water treatment plant of the establishment. Ambient air monitoring inside the establishment revealed no presence of hazardous substances in the environment.

Appendix Full Report A / type of accident:

Due to the rupture of a pipe (probably because of material failure), a power failure occurred and the plant was automatically put in hot-stand-by mode (feed and energy supply automatically cut out). The plant was gradually cooled down. After about half an hour, for reasons not yet clarified, a fire started at the outlet of the alkylation reactor (code 1202).

Appendix Full Report A / dangerous substances:

The total establishment and the potential directly involved inventories of hydrogen, methane, benzene and toluene refer to the whole amount involved in the accident (it had been estimated in about 10,000 Kg). No data are available about their single amounts. From the Original Report it is not fully clear if substances listed above are starting materials or not.

Appendix Full Report A / source of accident - remarks:

The accident occurred during normal operation in a plant for further processing of crude cracked gasoline (code 3102) of a petrochemical industry (code 2002). This industry included also an alkylation process unit. The component involved was the alkylation reactor (code 4002). From the Original Report it is not fully clear it it was a chemical continuous reaction or not.

Appendix Full Report A / causes of major occurrence:

The rupture of the pipe was probably due to material failure (code 5101). No information are available about the development of the fire at the outlet of the alkylation reactor because when the Original Report was prepared material investigations were still in progress (code 5501).

Appendix Full Report B / area concerned - remarks:

In the Original Report there is no evidence of significant effects outside the establishment.

Appendix Full Report B / ecological harm:

In the Original Report there is no evidence of significant ecological harms.

Appendix Full Report B / material loss:

The accident caused damages inside the establishment. The cost of the material damages has been estimated in about 2`5 millions of Deutch Marcs (about 1`2.5 MECU).

Appendix Full Report B / disruption of community life:

In the Original Report there is no evidence of significant effects outside the establishment.

Appendix Full Report C / lesson learned - prevent:

To be defined after material investigations will be concluded.