

Utsläpp och påföljande brand på en organisk kemisk anläggning.

840912 MARS 1800_218_01

Vid rutinmässig drift läckte etylenoxid ut från en fläns och antändes. En brand uppstod i området mellan en blandare och reaktionskärl. Tillflödet av etylenoxid ströps genom att lämpliga ventiler stängdes och branden kom snabbt under kontroll.

Inblandade ämnen och mängder

	CAS Nr.	Mängd
etylenoxid	75-21-8	okänt

Skador:

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

Erfarenheter redovisade (Ja/Nej): Ja

Kortfattat anges förebyggande åtgärder.

Report Profile

Identification of Report:

country: FA ident key: 1800_218_01

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

Date of Major Occurrence: Time of Major Occurrence

start: 12/09/1984 start:

finish: 12/09/1984 finish:

Establishment:

name:

address:

industry: 2001 general chemicals manufacture

Organic Chemical (Ethoxyacetic Production Plant)

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: 1800_218_01

Accident Types:

release: Yes explosion: No

water contamination: No other: No

fire: Yes

description:

SYSTEM ORIGINATING AND OPERATING CONDITIONS:... see Appendix Short Report / description of accident types

Substance(s) Directly Involved:

toxic: Yes explosive: Yes

ecotoxic: No other: No

flammable: Yes

description:

- Ethylene Oxide (C.A.S. CODE: 75-21-8): amount involved = not known.

Immediate Sources of Accident:

storage: No transfer: No

process: Yes other: No

description:

The accident occurred during normal operation of a ethoxyacetic production plant in an organic chemical industry. The component involved was a flange on the ethylene oxide pipeline in the area between the mixer and the reactors.

Suspected Causes:

plant or equipment: Yes environmental: No

human: No other: No

description:

CAUSES:

The spilling of ethylene oxide was caused by the rupture of a flange.

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:

The fire caused large damages to the plant but no data are available about the cost of the material losses.

Emergency Measures taken:

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

external services: No **restoration:** No

sheltering: No **other:** No

evacuation: No

description:

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

Immediate Lessons Learned:

prevention: Yes **other:** No

mitigation: No

description:

MEASURES TO PREVENT ANY RECURRENCE OF SIMILAR ACCIDENTS:... see Appendix Short Report / description of

immediate lessons learned

A Occurrence Full Report

country: FA **ident key:** 1800_218_01

1 Type of Accident

remarks: Ethylene oxide, released from a flange (code 1102), was ignited resulting in

a fire in the area between the mixer and the reactors (code 1202). The fire

was fed by the escaping ethylene oxide from the flange until the plant was

shut-down an... see Appendix Full Report A / type of accident

2 Dangerous Substances

remarks: No data are available about the amount of ethylene oxide involved in the

accident.

3 Source of Accident

illustration: - not applicable -

remarks: The accident occurred during normal operation of a ethoxyacetic production

plant in an organic chemical industry (codes 3102 and 2001). The component

involved was a flange (code 4011) on the ethylene oxide pipeline in the area

between the m... 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 5102 operation: component/machinery failure/malfunction

- not applicable -

- not applicable -

- not applicable -

- not applicable -

human / organizational - not applicable -

- not applicable -

- not applicable -

- not applicable -

- not applicable -

remarks: The spilling of ethylene oxide was caused by the rupture of a flange (code 5102).

6 Discussion about the Occurrence

- not applicable -

Type of Accident country: FA ident key: 1800_218_01

event:

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

initiating event 1102 release: fluid release to ground

associated event - not applicable -

Dangerous substances

country: FA ident key: 1800_218_01

a) total establishment inventory

CAS number: 75-21-8 **identity:** Ethylene Oxide

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): -1

use of substance as: STARTING MATERIAL

b) substance belongs to relevant inventory directly involved: Yes

actual quantity: -1 **potential quantity:** -1

c) substance belongs to relevant inventory indirectly involved: No

actual quantity: -1 indir_pot_quant: -1

Source of Accident - Situation country: FA ident key: 1800_218_01

situation

industry

initiating event 2001 general chemicals manufacture

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 4011 general pipework/flanges

initiating event 4011 general pipework/flanges

associated event - not applicable -

B Consequences Full Report

country: FA ident key: 1800_218_01

1 Area concerned

affected

extent of effects installation: Yes

establishment: No

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 p... see Appendix

Full Report B / area concerned - remarks

2 People

establishment popul. emergency personnel off-site population

total at risk -1 0 0

immediate fatalities 0 0 0

subsequent fatalities 0 0 0

hospitalizing injuries 0 0 0

other serious injuries 0 0 0

health monitoring 0 0 0

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 -1 -1 0 0

response, clean up, restoration -1 -1 0 0

remarks The fire caused large damages to the plant but no data are available about the c... 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 p... see Appendix

7 Discussion of Consequences

C Response Full Report

country: FA **ident key:** 1800_218_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

After the accident, the follow... see Appendix Full Report C / lesson learned - prevent

measures to mitigate consequences:

not given

useful references:

not given

5 Discussion about Response

- not applicable -

Appendices for the FA / 1800_218_01 report

Appendix Short Report / description of accident types:

SYSTEM ORIGINATING AND OPERATING CONDITIONS:

Normal operation.

SAFETY SYSTEMS OR OPERATORS INTERVENTION:

The plant was shut-down and the alarm sounded.

OTHER SYSTEMS INVOLVED AND OPERATING CONDITIONS:

The fire developed in the area between the mixer and the reactors.

ACCIDENT CASE HISTORY DESCRIPTION:

Ethylene oxide, released from a flange, was ignited resulting in a fire in the area between the mixer and the reactors. The fire was fed by the escaping ethylene oxide from the flange until the plant was shut-down and the quick isolation valves on the line were closed. The fire was extinguished in a short-time.

Appendix Short Report / description of emergency measures taken:

INTERNAL TO THE ESTABLISHMENT:

The fire was fed by the escaping ethylene oxide from the flange until the plant was shut-down and the quick isolation valves on the line were closed. The fire was extinguished in a short-time.

Appendix Short Report / description of immediate lessons learned:

MEASURES TO PREVENT ANY RECURRENCE OF SIMILAR ACCIDENTS:

After the accident, the following measures were established:

- 1- exclusion of ignition sources through the installation of explosion-proof electrical equipments;
- 2- extensive use of inerting substances to avoid the decomposition of ethylene oxide in the reactor.

Appendix Full Report A / type of accident:

Ethylene oxide, released from a flange (code 1102), was ignited resulting in a fire in the area between the mixer and the reactors (code 1202). The fire was fed by the escaping ethylene oxide from the flange until the plant was shut-down and the quick isolation valves on the line were closed.

Appendix Full Report A / source of accident - remarks:

The accident occurred during normal operation of a ethoxyacetic production plant in an organic chemical industry (codes 3102 and 2001). The component involved was a

flange (code 4011) on the ethylene oxide pipeline in the area between the mixer and the reactors. From the Original Report it is not fully clear if it was a batch process or not.

Appendix Full Report B / area concerned - remarks:

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

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 fire caused large damages to the plant but no data are available about the cost of the material losses.

Appendix Full Report B / disruption of community life:

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

Appendix Full Report C / lesson learned - prevent:

After the accident, the following measures were established:

- 1- exclusion of ignition sources through the installation of explosion-proof electrical equipments;
- 2- extensive use of inerting substances to avoid the decomposition of ethylene oxide in the reactor.