

Utsläpp från organisk kemisk anläggning.

911126 MARS 1991_20

Olyckan inträffade i ett rum med trycksatta tankar med väteklorid. Vid överföring av väteklorid till en av dessa tankar uppstod ett läckage på grund av en bristfällig ventil. Företagets interna brandkår anropade omedelbart räddningstjänsten. Man använde sig av vattengardiner för att begränsa spridningen av vätekloriden. Då vätekloriden nådde fabriksområdets utkanter varnades allmänheten av polisen. Grannföretag varnades per telefon. Molnet skingrades snart i luften.

Inblandade ämnen och mängder

	CAS Nr.	Mängd
väteklorid	7647-01-0	60 kg

Skador:

Människor: 4 personer på anläggningen förgiftades av vätekloridutsläppet.

Materiella: Inga.

Miljö/ekologi: Inga effekter rapporterade.

Infrastruktur: Allmänheten varnades.

Erfarenheter redovisade (Ja/Nej): Ja

Kortfattat anges förebyggande åtgärder.

Report Profile

Identification of Report:

country: FA ident key: 1991_020_01

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

Date of Major Occurrence: Time of Major Occurrence

start: 1991-11-26 start:

finish: finish:

Establishment:

name:

address:

industry: 2001 general chemicals manufacture

Organic Chemical

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: 1991_020_01

Accident Types:

release: Yes explosion: No

water contamination: No other: No

fire: No

description:

ENVIRONMENTAL AND ATMOSPHERICAL CONDITIONS:... see Appendix Short Report / description of accident types

Substance(s) Directly Involved:

toxic: Yes explosive: No

ecotoxic: No other: Yes

flammable: No

description:

- Hydrogen Chloride (C.A.S. CODE: 7647-01-0, E.E.C. CODE: 017-002-00-2): amount involved = 60 Kg.

Immediate Sources of Accident:

storage: Yes transfer: Yes

process: No other: No

description:

The accident occurred in a storage room for pressure tanks containing hydrogen chloride in an organic chemical industry. Hydrogen chloride was delivered in pressure tanks with a net content of 620 Kg and, depending on ambient temperature, t... see Appendix Short Report / description of immediate sources

Suspected Causes:

plant or equipment: Yes environmental: No

human: Yes other: No

description:

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

Immediate Effects:

material loss: No

human deaths: No

human injuries: Yes community disruption: Yes

other: Yes

ecological harm: No

national heritage loss: No

description:

EFFECTS ON PEOPLE:... see Appendix Short Report / description of immediate effects

Emergency Measures taken:

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

external services: Yes **restoration:** No

sheltering: Yes **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: Yes

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:** 1991_020_01

1 Type of Accident

remarks: During the transfer of hydrogen chloride to a receiver in the basement of a storage room, a flexible rubber tube was connected to the draining valve.

Then the needle valve was opened from outside with a special wrench. Due to a defective va... see Appendix Full Report A / type of accident

2 Dangerous Substances

remarks: The total establishment and the potential directly involved inventories of hydrogen chloride refer to the whole contents of hydrogen chloride in the storage room. From the Original Report it is not fully clear if hydrogen chloride is a star... see Appendix Full Report A / dangerous substances

3 Source of Accident

illustration: - not applicable -

remarks: The accident occurred in a storage room for pressure tanks (code 3201) containing hydrogen chloride in an organic chemical industry (code 2001).

Hydrogen chloride was delivered in pressure tanks with a net content of 620

Kg and, depending o... 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): South-West

stability (Pasquill):

ambient temperature (°C):

remarks: Wind from South-West.

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 5308 organization: design of plant/equipment/system (inadequate, inappropriate)

5404 person: malicious intervention

- not applicable -

- not applicable -

- not applicable -

remarks: The accident was caused by a defective drainage valve (code 5102) installed on the tank filled with hydrogen chloride. As it was possible to establish that it was not an unintentional extraction of the valve rod, an external manipulation ca... see Appendix

Full Report A / causes of major occurrence

6 Discussion about the Occurrence

- not applicable -

Type of Accident country: FA ident key: 1991_020_01

event:

major occurrence 1101 release: gas/vapour/mist/etc release to air

initiating event 1101 release: gas/vapour/mist/etc release to air

associated event - not applicable -

Dangerous substances

country: FA ident key: 1991_020_01

a) total establishment inventory

CAS number: 7647-01-0 **identity:** Chlorine

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): 0,62

use of substance as: STARTING MATERIAL

b) substance belongs to relevant inventory directly involved: Yes

actual quantity: 0,06 **potential quantity:** 0,62

c) substance belongs to relevant inventory indirectly involved: No

actual quantity: -1 **indir_pot_quant:** -1

Source of Accident - Situation **country:** FA **ident key:** 1991_020_01

situation

industry

initiating event 2001 general chemicals manufacture

associated event - not applicable -

activity/unit

major occurrence 3201 storage: process-associated (stockholding, etc. on-site of manufacture)

initiating event 3201 storage: process-associated (stockholding, etc. on-site of manufacture)

associated event - not applicable -

component

major occurrence 4004 container; pressurised (bullet, sphere, cylinder, etc.)

initiating event 4004 container; pressurised (bullet, sphere, cylinder, etc.)

associated event - not applicable -

B Consequences Full Report

country: FA **ident key:** 1991_020_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 Even if, when the hydrogen chloride cloud reached the factory boundaries, the po... 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 4

other serious injuries

health monitoring

remarks Inside the establishment 4 people were intoxicated by the hydrogen chloride rele... see Appendix

Full Report B / people

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 ECU

material losses

response, clean up, restoration

remarks No material losses occurred except liquid hydrogen chloride released during the ... 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** No Yes No

- **media interest** No No No

- **political interest** No No No

remarks When the hydrogen chloride cloud reached the factory boundaries, the police aler... see Appendix

7 Discussion of Consequences

C Response Full Report

country: FA **ident key:** 1991_020_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:

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

useful references:

- not applicable -

5 Discussion about Response

- not applicable -

Appendices for the FA / 1991_020_01 report

Appendix Short Report / description of accident types:

ENVIRONMENTAL AND ATMOSPHERICAL CONDITIONS:

Wind from SouthWest.

ACCIDENT CASE HISTORY DESCRIPTION:

During the transfer of hydrogen chloride to a receiver in the basement of a storage room, a flexible rubber tube was connected to the draining valve. Then the needle valve was opened from outside with a special wrench. Due to a defective valve, hydrogen chloride was released to the storage room for pressure tanks. The amount released was bigger than the capacity of the water column and the hydrogen chloride reached the atmosphere. The company fire brigade was immediately alerted and the local fire brigade a little later. They laid out C-tubes to put on a water curtain to avoid hydrogen chloride vapours dispersion. When the hydrogen chloride cloud reached the factory boundaries, the police alerted nearby population with loudspeakers and other industrial installations were informed by telephone. The hydrogen chloride cloud soon dispersed by itself.

Appendix Short Report / description of immediate sources:

The accident occurred in a storage room for pressure tanks containing hydrogen chloride in an organic chemical industry. Hydrogen chloride was delivered in pressure tanks with a net content of 620 Kg and, depending on ambient temperature, the internal pressure was 25~30 bar. The accident occurred during transfer operation of hydrogen chloride to the receiver in the basement.

Appendix Short Report / description of suspected causes:

CAUSES:

The accident was caused by a defective drainage valve installed on the tank filled with hydrogen chloride. As it was possible to establish that it was not an unintentional extraction of the valve rod, an external manipulation can not be excluded. The insufficient capacity of the water column was due to an inadequate plant design.

Appendix Short Report / description of immediate effects:

EFFECTS ON PEOPLE:

Inside the establishment 4 people were intoxicated by the hydrogen chloride release.

OTHER:

No material losses occurred except liquid hydrogen chloride released during the accident.

COMMUNITY DISRUPTION:

When the hydrogen chloride cloud reached the factory boundaries, the police alerted nearby population with loudspeakers and other industrial installations were informed by telephone.

Appendix Short Report / description of emergency measures taken:

INTERNAL TO THE ESTABLISHMENT:

The company fire brigade was immediately alerted and the local fire brigade a little later. They laid out C-tubes to put on a water curtain to avoid hydrogen chloride vapours dispersion.

EXTERNAL TO THE ESTABLISHMENT:

When the hydrogen chloride cloud reached the factory boundaries, the police alerted nearby population with loudspeakers and other industrial installations were informed by telephone.

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- sealing of cylinders;
- 2- the taps on the cylinders to be equipped with cotter pins secured by steel chains during transport;
- 3- chamber volume enlarged (doubled) so that no liquid hydrogen chloride could escape.

MEASURE TO MITIGATE THE EFFECTS OF THE ACCIDENT:

After the accident, the following measures were established:

- 1- automatic shut-down procedure of the system to be installed;
- 2- personnel may leave the plant as soon as possible in case of emergencies.

Appendix Full Report A / type of accident:

During the transfer of hydrogen chloride to a receiver in the basement of a storage room, a flexible rubber tube was connected to the draining valve. Then the needle valve was opened from outside with a special wrench. Due to a defective valve, hydrogen chloride was released to the storage room for pressure tanks. The amount released was bigger than the capacity of the water column and the hydrogen chloride reached the atmosphere (code 1101).

Appendix Full Report A / dangerous substances:

The total establishment and the potential directly involved inventories of hydrogen chloride refer to the whole contents of hydrogen chloride in the storage room. From the Original Report it is not fully clear if hydrogen chloride is a starting material or not.

Appendix Full Report A / source of accident - remarks:

The accident occurred in a storage room for pressure tanks (code 3201) containing hydrogen chloride in an organic chemical industry (code 2001). Hydrogen chloride was delivered in pressure tanks with a net content of 620 Kg and, depending on ambient temperature, the internal pressure was 25-30 bar (code 4004). The accident occurred during transfer operation of hydrogen chloride to the receiver in the basement.

Appendix Full Report A / causes of major occurrence:

The accident was caused by a defective drainage valve (code 5102) installed on the tank filled with hydrogen chloride. As it was possible to establish that it was not an unintentional extraction of the valve rod, an external manipulation can not be excluded (code 5404). The insufficient capacity of the water column was due to an inadequate plant design (code 5308).

Appendix Full Report B / area concerned - remarks:

Even if, when the hydrogen chloride cloud reached the factory boundaries, the police alerted nearby population with loudspeakers and other industrial installations were informed by telephone, in the Original Report there is no evidence of significant effects outside the establishment.

Appendix Full Report B / people:

Inside the establishment 4 people were intoxicated by the hydrogen chloride release.

Appendix Full Report B / ecological harm:

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

Appendix Full Report B / material loss:

No material losses occurred except liquid hydrogen chloride released during the accident.

Appendix Full Report B / disruption of community life:

When the hydrogen chloride cloud reached the factory boundaries, the police alerted nearby population with loudspeakers and other industrial installations were informed

by telephone.

Appendix Full Report C / lesson learned - prevent:

After the accident, the following measures were established:

- 1- sealing of cylinders;
- 2- the taps on the cylinders to be equipped with cotter pins secured by steel chains during transport;
- 3- chamber volume enlarged (doubled) so that no liquid hydrogen chloride could escape.

Appendix Full Report C / lesson learned - mitigate:

After the accident, the following measures were established:

- 1- automatic shut-down procedure of the system to be installed;
- 2- personnel may leave the plant as soon as possible in case of emergencies.