

Rubrik

840208 MARS 1800_49

Olyckan inträffade i en anläggning för produktion av en klorförening. Långvarig korrosion hade försvagat en rörledning nära en rörkrök så att den brast och flytande klor läckte ut.

Inblandade ämnen och mängder

	CAS Nr.	Mängd
klor	7782-50-5	500 kg

Skador:

Människor: En person skadades av klorgasen.

Materiella: Inga.

Miljö/ekologi: Inga effekter rapporterade.

Infrastruktur: Inga.

Erfarenheter redovisade (Ja/Nej): Ja

Endast mycket kortfattat om förebyggande åtgärd.

Report Profile

Identification of Report:

country: FA ident key: 1800_049_01

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

Date of Major Occurrence: Time of Major Occurrence

start: 1984-02-08 start:

finish: finish:

Establishment:

name:

address:

industry: 2001 general chemicals manufacture

Halogen, Alkali, Phosphorous & Sulphur Industry (Cyanuric Chloride 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_049_01

Accident Types:

release: Yes explosion: No

water contamination: No other: No

fire: No

description:

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

Substance(s) Directly Involved:

toxic: Yes explosive: No

ecotoxic: No other: No

flammable: No

description:

- Chlorine (C.A.S. CODE: 7782-50-5, E.E.C. CODE: 017-001-00-7): amount involved = about 500 kg.

Immediate Sources of Accident:

storage: Yes transfer: No

process: Yes other: No

description:

The accident occurred in a cyanuric chloride production plant of a halogen, alkali, phosphorous and sulphur industry. The component involved was a piping (80 mm diameter, 3.2 mm wall thickness, operating at 6 bar) in a liquid chlorine servi... see Appendix Short Report / description of immediate sources

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: 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:** 1800_049_01

1 Type of Accident

remarks: A long-term corrosion process on the outer surface of a piping (on a bridge near the elbow of the connection pipe) due to accumulation of moisture in the insulation material of the piping and the subsequent formation of corrosive acid beca... see Appendix Full Report A / type of accident

2 Dangerous Substances

remarks: The total establishment and the potential directly involved inventories of chlorine refer to the amount released during the accident.

3 Source of Accident

illustration: - not applicable -

remarks: The accident occurred in a cyanuric chloride production plant of a halogen, alkali, phosphorous and sulphur industry (code 2001). The component involved was a piping [code 4011] (80 mm diameter, 3.2 mm wall thickness, operating at 6 bar) in... 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

5104 operation: corrosion/fatigue

- not applicable -

- not applicable -

- not applicable -

human / organizational 5307 organization: process analysis (inadequate, incorrect)

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

inappropriate)

- not applicable -

- not applicable -

- not applicable -

remarks: A long-term corrosion process (code 5104) on the outer surface of the piping due to accumulation of moisture in the insulation material of the piping and the subsequent formation of corrosive acid because of electrolytic phenomenon, caused ... see Appendix

Full Report A / causes of major occurrence

6 Discussion about the Occurrence

- not applicable -

Type of Accident country: FA ident key: 1800_049_01

event:

major occurrence 1102 release: fluid release to ground

initiating event 1102 release: fluid release to ground

associated event - not applicable -

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: 1800_049_01

a) total establishment inventory

CAS number: 7782-50-5 **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): 0,5

use of substance as: NORMAL FINISHED PRODUCT

b) substance belongs to relevant inventory directly involved: Yes

actual quantity: 0,5 potential quantity: 0,5

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_049_01

situation

industry

initiating event 2001 general chemicals manufacture

associated event - not applicable -

activity/unit

major occurrence 3104 process: physical operations (mixing, melting crystallizing, etc.)

initiating event 3104 process: physical operations (mixing, melting crystallizing, etc.)

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_049_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 the population external to the establishment was alerted, in the Original... 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 1

other serious injuries

health monitoring

remarks Inside the establishment 1 person was injured by the chlorine release.... 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 preventing human access or activities) Suspected

- 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 the chlorine released during the accident.... 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 Even if the population external to the establishment was alerted, in the Original... see Appendix

7 Discussion of Consequences

C Response Full Report

country: FA ident key: 1800_049_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, it was est... see Appendix Full Report C / lesson learned - prevent

measures to mitigate consequences:

After the accident, it was est... see Appendix Full Report C / lesson learned - mitigate

useful references:

- not applicable -

5 Discussion about Response

- not applicable -

Appendices for the FA / 1800_049_01 report

Appendix Short Report / description of accident types:

ACCIDENT CASE HISTORY DESCRIPTION:

A long-term corrosion process on the outer surface of a piping (on a bridge near the elbow of the connection pipe) due to accumulation of moisture in the insulation material of the piping and the subsequent formation of corrosive acid because of electrolytic phenomenon, caused the leakage of liquid chlorine. The crack became as large as 15 mm in diameter during the accident.

Appendix Short Report / description of immediate sources:

The accident occurred in a cyanuric chloride production plant of a halogen, alkali, phosphorous and sulphur industry. The component involved was a piping (80 mm diameter, 3.2 mm wall thickness, operating at 6 bar) in a liquid chlorine service connecting a storage tank with the evaporator.

Appendix Short Report / description of suspected causes:

CAUSES:

A long-term corrosion process on the outer surface of the piping due to accumulation of moisture in the insulation material of the piping and the subsequent formation of corrosive acid because of electrolytic phenomenon, caused the leakage of liquid chlorine.

Appendix Short Report / description of immediate effects:

EFFECTS ON PEOPLE:

Inside the establishment 1 person was injured by the chlorine release.

COMMUNITY DISRUPTION:

The population external to the establishment was alerted.

OTHER:

No material losses occurred except the chlorine released during the accident.

Från 1800_048 kommer denna text:

The epichlorhydrine production plant was completely destroyed. Outside the establishment the windows' glasses of the nearby houses were ruptured due to the shock wave generated by the explosion. No data are available about the cost of the material damages.

Från ytterligare en annan olycka, eventuellt flera.

The main problem after the incident were the large amounts of white asbestos scattered around and outside the establishment. Sufficiently protected fire brigade personnel took care of the removal of the asbestos on the days immediately after the explosion. (1) the fire water was contaminated with gasoline due to violation of procedures (back-flow through a nose, connecting a hydrant and a drum) (2) no safety advice during contract negotiations for renting the mobile pump

Text från 1800_31 kan identifieras. The Internal Emergency Plan was activated (code 7100). Gaz de France put in operation the safety resources (personnel and materials [code 7201]) available at Beynes (Yvelines). The release was halted with the assistance of a specialized contractor (code 7205) called in by the manufacturer, who covered the escape source with sludge and brought the bar to its original position by increasing the loading on it (code 7501). The External Emergency Plan was activated and the Authorities were alerted (code 7200). The Fire Brigade was mobilized but its intervention was not necessary (code 7201). The Police (code 7203) kept curious people away at a safe distance of 300m (code 7207). No emergency measures are still required, neither on-site nor off-site (code 7703).

Appendix Short Report / description of emergency measures taken:

INTERNAL TO THE ESTABLISHMENT:

The internal alarm was sounded and the fire brigade intervened. The pipeline was isolated and then depressurized and emptied.

EXTERNAL TO THE ESTABLISHMENT:

The fire brigade put on, at about 100 meters from the firm fence, a water curtain. The population external to the establishment was alerted.

Appendix Short Report / description of immediate lessons learned:

MEASURES TO PREVENT ANY RECURRENCE OF SIMILAR ACCIDENTS:

After the accident, it was established the replacement of the insulated piping with a non-insulated one of smaller volume.

MEASURES TO MITIGATE THE EFFECTS OF THE ACCIDENT:

After the accident, it was established the connection of this piping to a collection tank in order to make it possible to empty it rapidly when necessary.

Appendix Full Report A / type of accident:

A long-term corrosion process on the outer surface of a piping (on a bridge near the elbow of the connection pipe) due to accumulation of moisture in the insulation material of the piping and the subsequent formation of corrosive acid because of electrolytic phenomenon, caused the leakage of liquid chlorine (codes 1101 and 1102).

Appendix Full Report A / source of accident - remarks:

The accident occurred in a cyanuric chloride production plant of a halogen, alkali, phosphorous and sulphur industry (code 2001). The component involved was a piping [code 4011] (80 mm diameter, 3.2 mm wall thickness, operating at 6 bar) in a liquid chlorine service connecting a storage tank with the evaporator (code 3104).

Appendix Full Report A / causes of major occurrence:

A long-term corrosion process (code 5104) on the outer surface of the piping due to accumulation of moisture in the insulation material of the piping and the subsequent formation of corrosive acid because of electrolytic phenomenon, caused the leakage of liquid chlorine (code 5102). The underlying causes which led to the piping corrosion were both inadequate design plant and process analysis (codes 5307 and 5308).

Appendix Full Report B / area concerned - remarks:

Even if the population external to the establishment was alerted, in the Original Report there is no evidence of significant effects outside the establishment.

Appendix Full Report B / people:

Inside the establishment 1 person was injured by the chlorine 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 the chlorine released during the accident.

Appendix Full Report B / disruption of community life:

Even if the population external to the establishment was alerted, in the Original Report there is no evidence of significant effects outside the establishment.

Appendix Full Report C / lesson learned - prevent:

After the accident, it was established the replacement of the insulated piping with a non-insulated one of smaller volume.

Appendix Full Report C / lesson learned - mitigate:

After the accident, it was established the connection of this piping to a collection tank in order to make it possible to empty it rapidly when necessary.