

Klorutsläpp från en massafabrik.

900117 MARS 1990_01

Vid lossning av klor från en järnvägstank till blekeriet på en pappers- och massafabrik brast den stålförstärkta slangen och klor släpptes ut. Manskap i skyddskläder stängde ventiler på tankvagnen och blekeriet. Vattengardiner användes för att skölja bort klorgasen. Den utsläppta klormängden behandlades med natriumhydroxid i klordestrueringsanläggningen.

Inblandade ämnen och mängder

	CAS Nr.	Mängd
klor	7782-50-5	10 550 kg

Skador:

Människor: Enligt uppgift skadades 70 personer på anläggningen och 137 utanför av giftutsläppet och fick söka sjukhusvård.

Materiella: Inga.

Miljö/ekologi: Inga effekter rapporterade.

Infrastruktur: Inga.

Erfarenheter redovisade (Ja/Nej): Ja

Mycket kortfattat anges förebyggande åtgärder.

Report Profile

Identification of Report:

country: FA ident key: 1990_001_01

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

Date of Major Occurrence: Time of Major Occurrence

start: 1990-01-17 start: 14:00:00

finish: finish:

Establishment:

name:

address:

industry: 2018 paper manufacture, printing, publishing

Wood, Pulp & Paper (Cellulose Production)

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: 1990_001_01

Accident Types:

release: Yes explosion: No

water contamination: No other: No

fire: No

description:

SYSTEM ORIGINATING AND OPERATING CONDITIONS:... 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 = 10,550 kg.

Immediate Sources of Accident:

storage: No transfer: Yes

process: Yes other: No

description:

The accident occurred during chlorine unloading of a rail tank into the storage tank of the cellulose bleaching section of the cellulose production plant in a paper industry. The chlorine storage tank was located in a closed building. The c... see Appendix Short Report / description of immediate sources

Suspected Causes:

plant or equipment: Yes environmental: No

human: No other: No

description:

INITIATING EVENT AND CONSEQUENCES:... 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:** Yes

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:** 1990_001_01

1 Type of Accident

remarks: During chlorine unloading of a rail tank into the storage tank (located in a

closed building) of the cellulose bleaching section of the plant, the

steel-reinforced transfer hose burst, resulting in the emission of chlorine

into the environm... 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 during chlorine unloading (code 3304) of a rail tank

into the storage tank of the cellulose bleaching section of the cellulose

production plant in a paper industry (code 2018). The chlorine storage tank

was located 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: When the chlorine's release occurred there was a strong wind.

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)

- not applicable -

- not applicable -

- not applicable -

- not applicable -

remarks: The accident was caused by the bursting (code 5102), because of inadequate component design (code 5308), of the steel-reinforced transfer hose used for the unloading of a rail tank into the chlorine storage tank.

6 Discussion about the Occurrence

- not applicable -

Type of Accident country: FA ident key: 1990_001_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: 1990_001_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): 10,55

use of substance as: STARTING MATERIAL

b) substance belongs to relevant inventory directly involved: Yes

actual quantity: 10,55 potential quantity: 10,55

e) substance belongs to relevant inventory indirectly involved: No

actual quantity: -1 indir_pot_quant: -1

Source of Accident - Situation country: FA ident key: 1990_001_01

situation

industry

initiating event 2018 paper manufacture, printing, publishing

associated event - not applicable -

activity/unit

major occurrence 3304 transfer: loading/unloading activities (transfer interfaces)

initiating event 3304 transfer: loading/unloading activities (transfer interfaces)

associated event - not applicable -

component

major occurrence 4012 other transfer equipment/apparatus/vehicle

initiating event 4012 other transfer equipment/apparatus/vehicle

associated event - not applicable -

B Consequences Full Report

country: FA ident key: 1990_001_01

1 Area concerned

affected

extent of effects installation: Yes

establishment: Yes

off-site; local: Yes

off-site; regional: No

off-site; transboundary: No

illustration of effects - not applicable -

remarks 70 people inside and 137 outside the establishment were injured and hospitalized... 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 70 137

other serious injuries

health monitoring

remarks 70 people inside and 137 outside the establishment were injured and hospitalized... 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 the ruptured transfer hose and the released 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 No Yes No

- media interest No No No

- political interest No No No

remarks The population was warned and the rescue of injured people was organized.... see Appendix Full Re

7 Discussion of Consequences

C Response Full Report

country: FA ident key: 1990_001_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, 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 / 1990_001_01 report

Appendix Short Report / description of accident types:

SYSTEM ORIGINATING AND OPERATING CONDITIONS:

The accident occurred during unloading of a rail tank into a chlorine storage tank located in a closed building.

ACCIDENT CASE HISTORY DESCRIPTION:

During chlorine unloading of a rail tank into the storage tank (located in a closed building) of the cellulose bleaching section of the plant, the steel-reinforced transfer hose burst, resulting in the emission of chlorine into the environment. Isolation valves were closed to stop the chlorine emission by operators with suitable protective suits. The emitted chlorine was treated with caustic soda in the chlorine destroyer plant. Water curtains were used to wash out the chlorine within the factory. The population was warned and the rescue of injured people was organized.

Appendix Short Report / description of immediate sources:

The accident occurred during chlorine unloading of a rail tank into the storage tank of the cellulose bleaching section of the cellulose production plant in a paper industry. The chlorine storage tank was located in a closed building. The component involved was the steel-reinforced transfer hose used for the chlorine unloading into the storage tank.

Appendix Short Report / description of suspected causes:

INITIATING EVENT AND CONSEQUENCES:

Bursting of the steel-reinforced transfer hose used for chlorine transfer.

CAUSES:

The accident was caused by the bursting (because of inadequate component design) of the steel-reinforced transfer hose used for loading the chlorine storage tank from rail tank.

Appendix Short Report / description of immediate effects:

EFFECTS ON PEOPLE:

70 people inside and 137 outside the establishment were injured and hospitalized due to the toxic release.

OTHER:

No material losses occurred except the ruptured transfer hose and the released chlorine.

COMMUNITY DISRUPTION:

The population was warned and the rescue of injured people was organized.

Appendix Short Report / description of emergency measures taken:

INTERNAL TO THE ESTABLISHMENT:

Isolation valves were closed to stop the chlorine emission by operators with suitable protective suits. The emitted chlorine was treated with caustic soda in the chlorine destroyer plant. Water curtains were used to wash out the chlorine within the factory.

EXTERNAL TO THE ESTABLISHMENT:

The population was warned and the rescue of injured people was organized.

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- installation of quick-action isolation valves on loading/unloading parts of existing installations for toxic gases;
- 2- more frequent inspections of similar installations by Authorities and experts;
- 3- use of hydrogen peroxide instead of chlorine for cellulose bleaching;
- 4- development of additional safety requirements for storage installations of liquified toxic gases.

MEASURES TO MITIGATE THE EFFECTS OF THE ACCIDENT:

After the accident, it was established that the emergency plans and public warning systems had to be evaluated for possible improvement.

Appendix Full Report A / type of accident:

During chlorine unloading of a rail tank into the storage tank (located in a closed building) of the cellulose bleaching section of the plant, the steel-reinforced transfer hose burst, resulting in the emission of chlorine into the environment (code 1101). 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 Full Report A / source of accident - remarks:

The accident occurred during chlorine unloading (code 3304) of a rail tank into the storage tank of the cellulose bleaching section of the cellulose production plant in a paper industry (code 2018). The chlorine storage tank was located in a closed building. The component involved was the steel-reinforced transfer hose used for the chlorine storage tank loading (code 4012).

Appendix Full Report B / area concerned - remarks:

70 people inside and 137 outside the establishment were injured and hospitalized due to the toxic release.

Appendix Full Report B / people:

70 people inside and 137 outside the establishment were injured and hospitalized due to the toxic 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 ruptured transfer hose and the released chlorine.

Appendix Full Report B / disruption of community life:

The population was warned and the rescue of injured people was organized.

Appendix Full Report C / lesson learned - prevent:

After the accident, the following measures were established:

- 1- installation of quick-action isolation valves on loading/unloading parts of existing installations for toxic gases;
- 2- more frequent inspections of similar installations by Authorities and experts;
- 3- use of hydrogen peroxide instead of chlorine for cellulose bleaching;
- 4- development of additional safety requirements for storage installations of liquified toxic gases.

Appendix Full Report C / lesson learned - mitigate:

After the accident, it was established that the emergency plans and public warning systems had to be evaluated for possible improvement.