

# Brand på en fabrik för smörjmedel i petrokemisk industri.

901115 MARS 1800\_221\_01

Brand utbröt efter ett planerat produktionsstopp. Klockan 07 på morgonen läckte propan ut men åtgärdades inte då läckan ansågs liten. Efter skiftbytet kl 14 inleddes försök att åtgärda problemet. Strax efter halv fyra på eftermiddagen fattade propanen eld. Branden bekämpades med skum och var släckt kl 17.

## Inblandade ämnen och mängder

	CAS Nr.	Mängd
Propan	74-98-6	

## Skador:

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

## Erfarenheter redovisade (Ja/Nej): Ja

Mycket kortfattat anges förebyggande åtgärder.

## Report Profile

### Identification of Report:

country: FA ident key: 1800\_181\_01

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

### Date of Major Occurrence: Time of Major Occurrence

start: 17/01/1990 start: 14:00:00

finish: 17/01/1990 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: 1800\_181\_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:** 1800\_181\_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: 1800\_181\_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: 1800\_181\_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):** 1055

**use of substance as:** STARTING MATERIAL

**b) substance belongs to relevant inventory directly involved:** Yes

**actual quantity:** 1055 **potential quantity:** 1055

**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\_181\_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:** 1800\_181\_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** -1 0 -1

**immediate fatalities** 0 0 0

**subsequent fatalities** 0 0 0

**hospitalizing injuries** 70 0 137

**other serious injuries** 0 0 0

**health monitoring** 0 0 0

**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 DM ECU DM**

**material losses 0 0 0 0**

**response, clean up, restoration 0 0 0 0**

**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: 1800\_181\_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 given

### **5 Discussion about Response**

- not applicable -

## **Appendices for the FA / 1800\_181\_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. The epichlorohydrine 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. 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 hose, connecting a hydrant and a drum) (2) no safety advice during contract negotiations for renting the mobile pump. 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.