

## Utsläpp av toluen och salpetersyra på en kemikaliefabrik.

910706

MARS 1991\_NR

Rapporten innehåller text från

MARS 1800\_031

MARS 1800\_048

MARS 1800\_049

MARS 1990\_001

Under rutinmässig drift läckte salpetersyra ut genom en otät rörkoppling. Bultar i flänsen hade korroderat sönder på grund av salpetersyran. Den utsläppta salpetersyran försökte även en annan rörledning med toluen som läckte ut det också. Larmet gick och räddningstjänsten tillkallades. Alla rörledningar i området stängdes av. De utsläppta mängderna samlades upp och togs om hand. Allmänheten informerades.

### Inblandade ämnen och mängder

	CAS Nr.	Mängd
toluen	108-88-3	350 kg
salpetersyra 65%	7697-37-2	1060 kg

### Skador:

Människor:	Inga.
Materiella:	Rörledningar förstördes.
Miljö/ekologi:	Inga effekter rapporterade.
Infrastruktur:	Inga.

### Erfarenheter redovisade (Ja/Nej): Ja

Kortfattat anges förebyggande åtgärder.

## Report Profile

### Identification of Report:

country: FA ident key: 1991\_005\_01

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

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

start: 1991-07-06 start:

finish: finish:

### Establishment:

name:

address:

industry: 2001 general chemicals manufacture

General Chemical (Storage Area)

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\_005\_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:** Yes

**ecotoxic:** No **other:** No

**flammable:** Yes

**description:**

- Toluene (C.A.S. CODE: 108-88-3): amount involved = 350 Kg (about 400 litres)... see Appendix Short Report /

description of substances involved

**Immediate Sources of Accident:**

**storage:** Yes **transfer:** No

**process:** Yes **other:** No

**description:**

The accident occurred in the storage area of a general chemical industry and involved nitric acid and toluene

pipelines.

**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:** Yes

**human deaths:** No

**human injuries:** No **community disruption:** Yes

**other:** No

**ecological harm:** No

**national heritage loss:** No

**description:**

MATERIAL LOSS:... 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:** Yes

**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:** 1991\_005\_01

### **1 Type of Accident**

**remarks:** During normal operation, nitric acid leaked from a not tight flange

connection in the nitric acid pipeline. The flange's iron screws corroded

due to the nitric acid action and its connection opened. The released nitric

acid (code 1102) caus... see Appendix Full Report A / type of accident

### **2 Dangerous Substances**

**remarks:** The total establishment and the potential directly involved inventories of

nitric acid refer to the amount released during the accident (about 800

litres). The total establishment and the potential directly involved

inventories of toluene r... see Appendix Full Report A / dangerous

substances

### **3 Source of Accident**

**illustration:** - not applicable -

**remarks:** The accident occurred in the storage area (code 3201) of a general chemical

industry (code 2001) involving nitric acid and toluene pipelines (code

4011).

#### 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:** Caused by the release of nitric acid through a leak of a flange in the nitric acid

pipeline, the flange's iron screws corroded (code 5104) and its connection opened (code

5102). The use of flange's iron screws was due to insufficient proces... see Appendix Full

Report A / causes of major occurrence

#### 6 Discussion about the Occurrence

- not applicable -

**Type of Accident** country: FA ident key: 1991\_005\_01

**event:**

**major occurrence** 1102 release: fluid release to ground

**initiating event** 1102 release: fluid release to ground

**associated event** - not applicable -

#### Dangerous substances

country: FA ident key: 1991\_005\_01

**a) total establishment inventory**

**CAS number:** 108-88-3 **identity:** Toluene

**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): 0,35

use of substance as: STARTING MATERIAL

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

actual quantity: 0,35 potential quantity: 0,35

**c) substance belongs to relevant inventory indirectly involved:** No

actual quantity: -1 indir\_pot\_quant: -1

**a) total establishment inventory**

CAS number: 7697-37-2 identity: Nitric Acid

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): 1,06

use of substance as: STARTING MATERIAL

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

actual quantity: 1,06 potential quantity: 1,06

**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\_005\_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** 4011 general pipework/flanges

**initiating event** 4011 general pipework/flanges

**associated event** - not applicable -

## **B Consequences Full Report**

country: FA ident key: 1991\_005\_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 in the population was alerted, in the Original Report there is no evidence ... 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**

**other serious injuries**

**health monitoring**

**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 ECU

material losses

response, clean up, restoration

remarks The released nitric acid corroded steel part in the surroundings and caused a le... 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 alerted.

## 7 Discussion of Consequences

# C Response Full Report

country: FA ident key: 1991\_005\_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 followi... see Appendix Full Report C / lesson learned - prevent

measures to mitigate consequences:

- not applicable -

useful references:

- not applicable -

### **5 Discussion about Response**

- not applicable -

## **Appendices for the FA / 1991\_005\_01 report**

## **Appendix Short Report / description of accident types:**

### ACCIDENT CASE HISTORY DESCRIPTION:

During normal operation, nitric acid leaked from a not tight flange connection in the nitric acid pipeline. The flange's iron screws corroded due to the nitric acid action and its connection opened. The released nitric acid caused also a leak in a nearby pipeline, resulting in a toluene's release.

## **Appendix Short Report / description of substances involved:**

- Toluene (C.A.S. CODE: 108-88-3): amount involved = 350 Kg (about 400 litres).
- Nitric Acid [65%] (C.A.S. CODE: 7697-37-2): amount involved = 1,060 Kg (about 800 litres).

## **Appendix Short Report / description of suspected causes:**

### CAUSES:

Caused by the release of nitric acid through a leak of a flange in the nitric acid pipeline, the flange's iron screws corroded and its connection opened. The use of flange's iron screws was due to insufficient process analysis and component design.

## **TEXT från MARS 1800\_031 m.fl. källor:**

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 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. 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. 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 immediate effects:**

### MATERIAL LOSS:

The released nitric acid corroded steel parts in the surroundings and caused a leak in a nearby pipeline, resulting in a toluene's release. No data are available about the cost of the material losses.

### COMMUNITY DISRUPTION:

The population was alerted.

## **Appendix Short Report / description of emergency measures taken:**

### INTERNAL TO THE ESTABLISHMENT:

Alarm was given to the plant and town fire brigades. All the critical pipelines were shut-off. Released nitric acid and toluene were collected and disposed.

### EXTERNAL TO THE ESTABLISHMENT:

The population was alerted.

## **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- jacketing of the nitric acid pipe line in teflon;
- 2- substitution of steel flanges and screws with stainless steel ones.

## **Appendix Full Report A / type of accident:**

During normal operation, nitric acid leaked from a not tight flange connection in the nitric acid pipeline. The flange's iron screws corroded due to the nitric acid action and its connection opened. The released nitric acid (code 1102) caused also a leak in a nearby pipeline, resulting in a toluene's release (code 1102).

## **Appendix Full Report A / dangerous substances:**

The total establishment and the potential directly involved inventories of nitric acid refer to the amount released during the accident (about 800 litres). The total establishment and the potential directly involved inventories of toluene refer to the amount released during the accident (about 400 litres). From the Original Report it is not fully clear if toluene and nitric acid are starting materials or not.

**Appendix Full Report A / causes of major occurrence:**

Caused by the release of nitric acid through a leak of a flange in the nitric acid pipeline, the flange's iron screws corroded (code 5104) and its connection opened (code 5102). The use of flange's iron screws was due to insufficient process analysis (code 5307) and component design (code 5308).

**Appendix Full Report B / area concerned - remarks:**

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

**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 released nitric acid corroded steel part in the surroundings and caused a leak in a nearby pipeline, resulting in a toluene's release. No data are available about the cost of the material losses.

**Appendix Full Report C / lesson learned - prevent:**

After the accident the following measures were established:

- 1- jacketing of the nitric acid pipe line in teflon;
- 2- substitution of steel flanges and screws with stainless steel ones.