

# Explosion på en pyroteknisk fabrik.

941212

Mycket kortfattad

Explosionen inträffade vid transport av detonatorer från torkrum till ett angränsande rum. Detonatorerna var små mässingslådor som innehöll en explosiv blandning. Tre personer omkom och byggnaden totalförstördes. Taket blåstes bort och en vägg rasade. Olyckans orsak framgår inte.

## Inblandade ämnen och mängder

	CAS Nr.	Mängd
bariumnitrat	10022-31-8	okänt
aluminium in pulverform	7429-90-5	okänt
kalciumsilicid	120-13-55-7	okänt
antimonsulfid	1345-04-6	okänt
tetrazene (4-amidino-N'-nitroso-1-1-carboxymidohydrazide)	109-27-3	okänt
bly-2, 4, 6, -trinitroresorcinoxide	15245-44-0	okänt
gummi	9006-04-6	okänt
acetone	67-64-1	okänt
toluen	108-88-3	okänt
etanol	64-17-5	okänt
blydioxid	1309-174-5	okänt
"pyrotekniska substanser"		

## Skador:

Människor: Tre personer omkom.  
Materiella: Byggnaden totalförstördes.  
Miljö/ekologi: Inga effekter rapporterade.  
Infrastruktur: Inga effekter rapporterade.

Erfarenheter redovisade (Ja/Nej): Nej

## Report Profile

### Identification of Report:

country: FA ident key: 1800\_305\_01

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

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

start: 12/12/1994 start: 16:00:00

finish: 12/12/1994 finish:

### Establishment:

name:

address:

industry: 2999 other

pyrotechnic industry

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\_305\_01

### **Accident Types:**

release: No explosion: Yes

water contamination: No other: No

fire: No

description:

explosion of pyrotechnic substances resulting in 3 fatalities

### **Substance(s) Directly Involved:**

toxic: No explosive: Yes

ecotoxic: No other: No

flammable: No

description:

pyrotechnic substances

### **Immediate Sources of Accident:**

storage: No transfer: Yes

process: No other: No

description:

the explosion occurred during the transfer of detonators from the drying chamber to the timer room

### **Suspected Causes:**

**plant or equipment:** Yes **environmental:** No

**human:** No **other:** No

**description:**

no information is given in the short report

### **Immediate Effects:**

**material loss:** Yes

**human deaths:** Yes

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

**other:** No

**ecological harm:** No

**national heritage loss:** No

**description:**

no information is given in the short report

### **Emergency Measures taken:**

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

**external services:** No **restoration:** No

**sheltering:** No **other:** No

**evacuation:** No

**description:**

no information is given in the short report

### **Immediate Lessons Learned:**

**prevention:** No **other:** Yes

**mitigation:** No

**description:**

no information is given in the short report

## **A Occurrence Full Report**

**country:** FA **ident key:** 1800\_305\_01

### **1 Type of Accident**

**remarks:** - not applicable -

### **2 Dangerous Substances**

**remarks:** the material which exploded consisted in detonators (small boxes made out of brass containing an explosive mixture).

### **3 Source of Accident**

**illustration:** a simplified scheme of a detonator, a map of the building in which the explosion occurred showing the position of the victims and of the trolleys used for the transport of the detonators, and a simplified scheme of the hot air generator ar... see Appendix Full Report A / source of accident - illustration

**remarks:** The explosion occurred in a building with a drying chamber and a timer room.

#### 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** 5105 operation: instrument/control/monitoring-device failure

- not applicable -

- not applicable -

- not applicable -

- not applicable -

**human / organizational** - not applicable -

- not applicable -

- not applicable -

- not applicable -

- not applicable -

**remarks:** uncertain on cause identification

#### 6 Discussion about the Occurrence

- not applicable -

**Type of Accident** country: FA ident key: 1800\_305\_01

**event:**

**major occurrence** 1306 explosion: explosive decomposition (of unstable material)

**initiating event** - not applicable -

**associated event** - not applicable -

#### Dangerous substances

country: FA ident key: 1800\_305\_01

##### a) total establishment inventory

**CAS number:** 10022-31-8 **identity:** baryum nitrate

**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

use of substance as: - not applicable -

**b) substance belongs to relevant inventory directly involved:** No

actual quantity: 0 potential quantity: 0

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

actual quantity: 0 indir\_pot\_quant: 0

**a) total establishment inventory**

CAS number: 7429-90-5 identity: aluminium in powder

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

use of substance as: - not applicable -

**b) substance belongs to relevant inventory directly involved:** No

actual quantity: 0 potential quantity: 0

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

actual quantity: 0 indir\_pot\_quant: 0

**a) total establishment inventory**

CAS number: 120-13-55-7 identity: calcium silicide

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

use of substance as: - not applicable -

**b) substance belongs to relevant inventory directly involved:** No

actual quantity: 0 potential quantity: 0

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

actual quantity: 0 indir\_pot\_quant: 0

**a) total establishment inventory**

CAS number: 1345-04-6 identity: antimony sulphide

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

use of substance as: - not applicable -

**b) substance belongs to relevant inventory directly involved:** No

actual quantity: 0 potential quantity: 0

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

actual quantity: 0 indir\_pot\_quant: 0

**a) total establishment inventory**

CAS number: 109-27-3 identity: Tetrazene (4-amidino-N'-nitroso-1-1-carboxymidohydrazide)

name from Seveso I Directive: - not applicable -

name from Seveso II Directive: - not applicable -

category from Seveso II: explosive R3

other hazards (1): - not applicable -

other hazards (2): - not applicable -

maximum quantity (tonnes): -1

use of substance as: - not applicable -

**b) substance belongs to relevant inventory directly involved:** No

actual quantity: 0 potential quantity: 0

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

actual quantity: 0 indir\_pot\_quant: 0

**a) total establishment inventory**

CAS number: 15245-44-0 identity:

name from Seveso I Directive: Lead 2,4,6-trinitroresorcinoxide (Lead styphnate)

name from Seveso II Directive: - not applicable -

category from Seveso II: explosive R3

other hazards (1): - not applicable -

other hazards (2): - not applicable -

maximum quantity (tonnes): -1

use of substance as: - not applicable -

**b) substance belongs to relevant inventory directly involved:** No

actual quantity: 0 potential quantity: 0

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

actual quantity: 0 indir\_pot\_quant: 0

**a) total establishment inventory**

CAS number: identity: pyrotechnic substances

name from Seveso I Directive: - not applicable -

name from Seveso II Directive: - not applicable -

category from Seveso II: explosive R2

other hazards (1): - not applicable -

other hazards (2): - not applicable -

maximum quantity (tonnes): -1

use of substance as: - not applicable -

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

actual quantity: -1 potential quantity: -1

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

actual quantity: 0 indir\_pot\_quant: 0

**a) total establishment inventory**

CAS number: 9006-04-6 identity: rubber

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

use of substance as: - not applicable -

**b) substance belongs to relevant inventory directly involved:** No

actual quantity: 0 potential quantity: 0

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

actual quantity: 0 indir\_pot\_quant: 0

**a) total establishment inventory**

CAS number: 67-64-1 identity: acetone

name from Seveso I Directive: - not applicable -

name from Seveso II Directive: - not applicable -

category from Seveso II: highly flammable liquids R17, R10

other hazards (1): - not applicable -

other hazards (2): - not applicable -

maximum quantity (tonnes): -1

use of substance as: - not applicable -

**b) substance belongs to relevant inventory directly involved:** No

actual quantity: 0 potential quantity: 0

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

actual quantity: 0 indir\_pot\_quant: 0

**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: highly flammable liquids R17, R10

other hazards (1): - not applicable -

other hazards (2): - not applicable -

maximum quantity (tonnes): -1

use of substance as: - not applicable -

**b) substance belongs to relevant inventory directly involved: No**

actual quantity: 0 potential quantity: 0

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

actual quantity: 0 indir\_pot\_quant: 0

**a) total establishment inventory**

CAS number: 64-17-5 identity: ethanol

name from Seveso I Directive: - not applicable -

name from Seveso II Directive: - not applicable -

category from Seveso II: highly flammable liquids R17, R10

other hazards (1): - not applicable -

other hazards (2): - not applicable -

maximum quantity (tonnes): -1

use of substance as: - not applicable -

**b) substance belongs to relevant inventory directly involved: No**

actual quantity: 0 potential quantity: 0

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

actual quantity: 0 indir\_pot\_quant: 0

**a) total establishment inventory**

CAS number: 1309-174-5 identity: lead dioxide

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

use of substance as: - not applicable -

**b) substance belongs to relevant inventory directly involved: No**

actual quantity: 0 potential quantity: 0

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

actual quantity: 0 indir\_pot\_quant: 0



**Source of Accident - Situation** country: FA ident key: 1800\_305\_01

## **situation**

**industry**

**initiating event** - not applicable -

**associated event** - not applicable -

**activity/unit**

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

**initiating event** - not applicable -

**associated event** - not applicable -

**component**

**major occurrence** 4006 free placement (unconfined pile, stack,etc; if bagged or in cylinders, more...F1!)

**initiating event** - not applicable -

**associated event** - not applicable -

## **B Consequences Full Report**

country: FA ident key: 1800\_305\_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** The roof of the building was blown away, the south wall fell on the protection e... see Appendix

Full Report B / area concerned - remarks

### **2 People**

**establishment popul. emergency personnel off-site population**

**total at risk** -1 -1 -1

**immediate fatalities** 3 0 0

**subsequent fatalities** 0 0 0

**hospitalizing injuries** 0 0 0

**other serious injuries** 0 0 0

**health monitoring** 0 0 0

**remarks** - not applicable -

### **3 Ecological Harm**

**pollution/contamination/damage of:**

- residential area (covered by toxic cloud) not applicable
- common wild flora/fauna (death or elimination) not applicable
- rare or protected flora/fauna (death or elimination) not applicable
- water catchment areas and supplies for consumption or recreation not applicable
- land (with known potential for long term ecological harm or not applicable preventing human access or activities)
- marine or fresh water habitat not applicable
- areas of high conservation value or given special protection not applicable

remarks The reinforced walls and the protection embankment have perfectly fulfilled the... 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 - not applicable -

#### **5 Material Loss**

establishment losses off site losses

costs (direct costs to operator) (social costs)

in ECU FFR ECU FFR

material losses -1 -1 -1 -1

response, clean up, restoration -1 -1 -1 -1

remarks - not applicable -

#### **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 No No

- media interest No No No

- political interest No No No

remarks - not applicable -

## 7 Discussion of Consequences

- not applicable -

# C Response Full Report

country: FA ident key: 1800\_305\_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**

no information is given

**measures to mitigate consequences:**

no information is given

**useful references:**

no information is given

### **5 Discussion about Response**

- not applicable -

## **Appendices for the FA / 1800\_305\_01 report**

#### **Appendix Full Report A / source of accident - illustration:**

a simplified scheme of a detonator, a map of the building in which the explosion occurred showing the position of the victims and of the trolleys used for the transport of the detonators, and a simplified scheme of the hot air generator are annexed.

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

The roof of the building was blown away, the south wall fell on the protection embankment. The inside of the building was completely destroyed. The external damages are very little (some broken windows).

#### **Appendix Full Report B / ecological harm:**

The reinforced walls and the protection embankment have perfectly fulfilled the function to contain the effects of an explosion.