

# Dammexplosion i en spannmålssilo

970820

Kortfattat anges endast att en dammexplosion inträffade i en spannmålssilo, och att 11 personer förolyckades. Orsaken anges kunna vara ett materialfel.

## Inblandade ämnen och mängder

	CAS Nr.	Mängd
damm		

## Skador:

**Människor:** Totalt 11 personer omkom. Av dessa var 7 fast anställda, 3 inhyrd personal, och en person var förbipasserande.

**Materiella:** Omfattande skador på anläggningen.

**Miljö/ekologi:** Inga effekter rapporterade.

**Infrastruktur:** Inga effekter.

## Erfarenheter redovisade (Ja/Nej): Ja

Kortfattat anges förebyggande åtgärder

## Report Profile

### Identification of Report:

country: FA ident key: 1800\_303\_01

reported under Seveso I directive as other event (non-Seveso) reports: SHORT+FULL

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

start: 20/08/1997 start: 10:15:00

finish: 20/08/1997 finish:

### Establishment:

name:

address:

industry: 2008 wholesale and retail storage and distribution (incl. LPG bottling & bulk distrib., more: F1! )

Stockage portuaire de céréales

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\_303\_01

**Accident Types:**

release: No explosion: Yes

water contamination: No other: No

fire: No

**description:**

Explosion of flammable dust in a silo of corn.

**Substance(s) Directly Involved:**

toxic: No explosive: No

ecotoxic: No other: No

flammable: Yes

**description:**

Dust of grain.

**Immediate Sources of Accident:**

storage: Yes transfer: No

process: No other: No

**description:**

Silo with 44 on 3 lines of 36 m high cylindrical cells made of concrete. The whole plant had a capacity of 47240 m3 or 37150 tons of wheat. There are device to remove the dust.

**Suspected Causes:**

plant or equipment: Yes environmental: No

human: No other: No

**description:**

The cause might be a material failure.

**Immediate Effects:**

material loss: Yes

human deaths: Yes

human injuries: Yes community disruption: No

other: No

**ecological harm:** No

**national heritage loss:** No

**description:**

11 people killed and 1 injured

**Emergency Measures taken:**

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

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

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

**evacuation:** No

**description:**

Search of casualties in the ruins. Action to prevent pollution of waters by rain water running on the area.

Demolition of remained walls.

**Immediate Lessons Learned:**

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

**mitigation:** No

**description:**

Attention for the risks of explosion in the grain silo or these one in which flammable dust can be emitted.

## A Occurrence Full Report

**country:** FA **ident key:** 1800\_303\_01

### 1 Type of Accident

**remarks:** - not applicable -

### 2 Dangerous Substances

**remarks:** The quantity of dust involved was not well known.

### 3 Source of Accident

**illustration:** Please specify the attached materials illustrating the location of the

establishment, relevant installation(s) and relevant surrounding

geographical features.

**remarks:** Silo with 44 cylindrical cells.

### 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** 5109 operation: electrostatic accumulation

5999 other: other

- not applicable -

- not applicable -

- not applicable -

**human / organizational** - not applicable -

- not applicable -

- not applicable -

- not applicable -

- not applicable -

**remarks:** The cause of airborne dust, the origin of the ignition are not known. It might be a sparkle from a shock or a static one.

## 6 Discussion about the Occurrence

- not applicable -

**Type of Accident** country: FA ident key: 1800\_303\_01

**event:**

**major occurrence** 1305 explosion: dust explosion

**initiating event** - not applicable -

**associated event** - not applicable -

## Dangerous substances

country: FA ident key: 1800\_303\_01

### a) total establishment inventory

**CAS number: identity:** dust

**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:** normal finished product

**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

**Source of Accident - Situation** country: FA ident key: 1800\_303\_01

**situation**

**industry**

**initiating event** - not applicable -

associated event - not applicable -

activity/unit

major occurrence 3202 storage: distribution-associated (not on-site of manufacture)

initiating event - not applicable -

associated event - not applicable -

component

major occurrence 4003 container; non-pressurised (hopper, tank, drum, bag, etc.)

initiating event - not applicable -

associated event - not applicable -

## B Consequences Full Report

country: FA ident key: 1800\_303\_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 please specify the attached materials illustrating the geographical extent

of th... see Appendix Full Report B / area concerned - illustration of

effects

remarks - not applicable -

### 2 People

establishment popul. emergency personnel off-site population

total at risk 21 -1 1

immediate fatalities 7 0 1

subsequent fatalities 0 0 0

hospitalizing injuries 0 0 0

other serious injuries 0 0 0

health monitoring 0 0 0

remarks 3 people of other firms than that operating the silo but who worked in (subcontr... see Appendix

Full Report B / people

### 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 no environmental damage

#### 4 National Heritage Loss

effects on:

- **historical sites** None - **historic monuments** None
- **historic buildings** None - **art treasures** None

remarks - not applicable -

#### 5 Material Loss

establishment losses off site losses

costs (direct costs to operator) (social costs)

in ECU FRF ECU FRF

material losses -1 -1 -1 -1

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

remarks The losses are not known yet.

#### 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 Yes
- **political interest** No No No

remarks - not applicable -

## 7 Discussion of Consequences

- not applicable -

## Ecological Components involved

country: FA ident key: 1800\_303\_01

type: - not applicable -

threatened: not applicable affected: No

## C Response Full Report

country: FA ident key: 1800\_303\_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**

Lowering of emissions of dust ... see Appendix Full Report C / lesson learned - prevent

**measures to mitigate consequences:**

Reexamination of the right saf... see Appendix Full Report C / lesson learned - mitigate

**useful references:**

Nothing to report

### **5 Discussion about Response**

- not applicable -

## **Appendices for the FA / 1800\_303\_01 report**

**Appendix Full Report B / area concerned - illustration of effects:**

please specify the attached materials illustrating the geographical extent of the effects.

**Appendix Full Report B / people:**

3 people of other firms than that operating the silo but who worked in (subcontractors, suppliers, truckers) were killed. A walker was killed.

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

Lowering of emissions of dust through an improvement of technology and conditions of operation and lowering of occurrence of ignition through the control of static electricity and hot spots.

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

Reexamination of the right safety distances.