

## Explosion och brand på en petrokemisk fabrik.

920508 MARS 1992\_15

Ett moln av etylengas bildades till följd av en läcka på en petrokemisk fabrik. Gasmolnet antändes och exploderade. En brand uppstod. Explosionen orsakade också ett utsläpp av salpetersyra i tjugo minuters tid. Ljudet av explosionen hördes flera kilometer bort. Rapporten är mycket knapphändig.

### Inblandade ämnen och mängder

	CAS Nr.	Mängd
etylen	74-85-1	okänt
salpetersyra	7697-37-2	okänt

### Skador:

Människor:	4 personer på anläggningen anges som skadade.
Materiella:	Skador på anläggningen. Fönster utanför fabriksområdet krossades vid explosionen.
Miljö/ekologi:	Inga effekter rapporterade.
Infrastruktur:	Inga.

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

## Report Profile

### Identification of Report:

country: FA ident key: 1992\_015\_01

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

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

start: 1992-05-08 start: 19:50:00

finish: finish:

### Establishment:

name:

address:

industry: - not applicable -

Petrochemical

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:** 1992\_015\_01

**Accident Types:**

**release:** Yes **explosion:** Yes

**water contamination:** No **other:** No

**fire:** Yes

**description:**

Due to a leakage in the Reactor area of a petrochemical industry, ethylene gas accumulated forming an unconfined gas cloud. The gas cloud was then ignited resulting in a violent deflagration followed by a fire.

The explosion also caused t... see Appendix Short Report / description of accident types

**Substance(s) Directly Involved:**

**toxic:** No **explosive:** Yes

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

**flammable:** Yes

**description:**

- Ethylene (C.A.S. CODE: 74-85-1, E.E.C. CODE: 601-010-00-3): amount involved = not known.... see Appendix

Short Report / description of substances involved

**Immediate Sources of Accident:**

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

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

**description:**

The accident occurred in the Reactor area of a petrochemical industry.

**Suspected Causes:**

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

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

**description:**

CAUSES:

The causes of the escape of ethylene gas have not been fully identified.

**Immediate Effects:**

**material loss:** Yes

**human deaths:** No

**human injuries:** Yes **community disruption:** Yes

**other:** No

**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:** No

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

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

**evacuation:** No

**description:**

INTERNAL TO THE ESTABLISHMENT... see Appendix Short Report / description of emergency measures taken

### **Immediate Lessons Learned:**

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

**mitigation:** No

**description:**

- not applicable -

## **A Occurrence Full Report**

**country:** FA **ident key:** 1992\_015\_01

### **1 Type of Accident**

**remarks:** Due to a leakage (code 1101) in the Reactor area of a petrochemical

industry, ethylene gas accumulated forming an unconfined gas cloud. The gas

cloud was then ignited resulting in a a violent deflagration (code 1307)

followed by a fire (cod... see Appendix Full Report A / type of accident

### **2 Dangerous Substances**

**remarks:** No data are available about the amounts of ethylene and nitric acid involved

in the accident.

### **3 Source of Accident**

**illustration:** - not applicable -

**remarks:** - not applicable -

### **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** 5501 other: not identified

- not applicable -

- not applicable -

- not applicable -

- not applicable -

**human / organizational** - not applicable -

- not applicable -

- not applicable -

- not applicable -

- not applicable -

**remarks:** The causes of the escape of ethylene gas have not been fully identified (code 5501).

## 6 Discussion about the Occurrence

- not applicable -

**Type of Accident** country: FA ident key: 1992\_015\_01

**event:**

**major occurrence** 1307 explosion: VCE (vapour cloud explosion; supersonic wave front)

**initiating event** - not applicable -

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

**event:**

**major occurrence** 1202 fire: pool fire (burning pool of liquid, contained or uncontained)

**initiating event** 1101 release: gas/vapour/mist/etc release to air

**associated event** 1101 release: gas/vapour/mist/etc release to air

## Dangerous substances

country: FA ident key: 1992\_015\_01

### a) total establishment inventory

**CAS number:** 7697-37-1 **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

**use of substance as:** STARTING MATERIAL

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

actual quantity: -1 potential quantity: -1

**e) substance belongs to relevant inventory indirectly involved:** Yes

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

**a) total establishment inventory**

CAS number: 74-85-1 identity: Ethylene

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: -1 indir\_pot\_quant: -1

## B Consequences Full Report

country: FA ident key: 1992\_015\_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 The noise of the shock wave was heard up to various km from the reactor. The exp... 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 4

other serious injuries

health monitoring

remarks Inside the establishment, 4 people were injured by the accident but the number h... 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** The accident caused damages both inside and outside the establishment (the explo... 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 noise of the shock wave was heard up to various km from the reactor. The exp... see Appendix

## 7 Discussion of Consequences

# C Response Full Report

**country:** FA **ident key:** 1992\_015\_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**

- not applicable -

**measures to mitigate consequences:**

- not applicable -

**useful references:**

- not applicable -

### **5 Discussion about Response**

- not applicable -

## **Appendices for the FA / 1992\_015\_01 report**

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

Due to a leakage in the Reactor area of a petrochemical industry, ethylene gas accumulated forming an unconfined gas cloud. The gas cloud was then ignited resulting in a violent deflagration followed by a fire. The explosion also caused the release in the atmosphere of nitric acid for about 20 minutes.

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

- Ethylene (C.A.S. CODE: 74-85-1, E.E.C. CODE: 601-010-00-3): amount involved = not known.

- Nitric Acid (C.A.S. CODE: 7697-37-2): amount involved = not known.

### **Appendix Short Report / description of immediate effects:**

**EFFECTS ON PEOPLE:**

Inside the establishment 4 people were injured by the accident but the number has to be confirmed.

**MATERIAL LOSS:**

The accident caused damages both inside and outside the establishment (the noise of the shock wave was heard up to various km from the reactor and it caused the breakage of the nearby windows's glasses). No data are available about the cost of the material losses.

**COMMUNITY DISRUPTION:**

The noise of the shock wave was heard up to various km from the reactor. The explosion caused the breakage of the nearby windows's glasses. The accident had impact on public.

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

**INTERNAL TO THE ESTABLISHMENT:**

The ethylene gas feeding to the plant was interrupted. The plant was polarized.

**EXTERNAL TO THE ESTABLISHMENT:**

The External Emergency Plan was activated.

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

Due to a leakage (code 1101) in the Reactor area of a petrochemical industry, ethylene gas accumulated forming an unconfined gas cloud. The gas cloud was then ignited resulting in a violent deflagration (code 1307) followed by a fire (code 1202 [ the type of fire has not been described in the Original Report]). The explosion also caused the release in the atmosphere of nitric acid for about 20 minutes (codes 1101 and 1102).

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

The noise of the shock wave was heard up to various km from the reactor. The explosion caused the breakage of the nearby windows's glasses.

**Appendix Full Report B / people:**

Inside the establishment, 4 people were injured by the accident but the number has to be confirmed. From the Original Report it is not fully clear that they were hospitalizing injuries.

**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 accident caused damages both inside and outside the establishment (the explosion caused the breakage of the nearby windows's glasses). No data are available about the cost of the material losses.

**Appendix Full Report B / disruption of community life:**

The noise of the shock wave was heard up to various km from the reactor. The explosion caused the breakage of the nearby windows's glasses. The External Emergency Plan was activated.